

VOL. 43, No. 3

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CONTENTS

TECHNICAL —

A Twelve Months Study of the 20 metre band between Melbourne and London	11
Commercial Kinks — FT200	21
Solar Flux and Sunspots	20
Some Useful Modifications to the FT101 Series	9
Vehicle Ignition Noise Suppression	5

GENERAL —

Darwin Relief Fund	18
Trade News	4

DEPARTMENTS —

Awards Column	18
Contests	17
Hamads	22
Intruder Watch	22
Letters to the Editor	19
Project Australia	21
QSP — IARU News	3
QSP	4, 7, 9
VHF-UHF — an expanding world	15
20 Years Ago	22

COVER PHOTO

"Foxhunting" is a popular 2 metre activity in Australia. It is surprising what excellent results are obtained with a simple three element beam mounted on the side of the car.

Photo: Roly Roper VK3YFF

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Reg. Office:
2/517 Toorak Rd., Toorak, Vic. 3142
P.O. Box 150, Toorak, Vic., 3142

Editor:
Bill Roper VK3ARZ

Assistant Editor:
Bruce Bathols VK3UV

Technical Editors:
Bill Rice VK3ABP
Ron Cook VK3AFW

Publications Committee:
John Adcock VK3ACA
Rodney Champness VK3UG
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Ron Fisher VK3OM
Ken Gillespie VK3GK
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Howard Rider VK3ZJY
Roly Roper VK3YFF
Gill Sones VK3AUI

Contributing Editors:
Brian Auslin VK5CA
Deane Blackman VK3TX
Eric Jamieson VK5LP
Jim Payne VK3AZT

Drafting Assistant:
Gordon Rowe L30187

Business Manager:
Peter B. Dodd VK3CIF

Enquiries and material to:
The Editor,
Box 2611W, GPO Melb., 3001

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Arrangements are going ahead well for the IARU R3 Association Conference in Hong Kong from 4th to 13th March in the Lee Gardens Hotel (see Jan. AR, p.6).

The Agenda for the Conference was circulated before Christmas and predictably includes the usual round of formalities including the appointment of Conference Chairman, Secretary and Asst. Sec., Credentials and Editorial Committees, Agenda and Rules of Procedure. Reports from officers, Society delegates and other interested amateurs are then taken, followed by discussions on these.

Then comes matters arising from the 1971 R3 Tokyo Conference, a summary and review of the 1971 ITU Space Conference by Tom Clarkson ZL2AZ and an address about the 1979 WARC by IARU President Mr. Noel Eaton VE3CJ.

The formulation and adoption of policies as the result of further discussions and appointments of Working Groups then follows in association with the best methods of implementing such policies.

Two additional matters arising from the 1971 Tokyo Conference are then on the agenda namely "Conformity with the ITU Radio Regulations" and "Development of amateur radio activity in Region II."

Discussion on the Intruder Watch Scheme is followed by general proposals submitted by member Societies, the budget, election of Directors for the next triennium, date and venue of the 4th IARU R3 Conference and formal closure.

The triennium budget as might be expected shows that inflation may well catch up with the R3 Association for the 4th Conference, not because of increases in the exceedingly modest secretarial expenses, but from anticipated travel and accommodation charges which would then have to be met for the Directors and officers of the Association despite the assumption that the Association should expand slightly. The budget prudently includes a little for travel expenses within the Region.

IN DAYS OF OLD

"A splendid attendance of members and visitors totalling about 100 was the result of a broadcast invitation. All were very enthusiastic and the meeting was an unparalleled success. Several proposal forms were filled in and a great many more were taken away for completion. A very interesting lecture on Induction Coil Construction was delivered by Mr. J. Strickland and was greatly appreciated by those present. A hearty vote of thanks was accorded the lecturer. Several specimens of home made instruments were on view." Excerpts from the minutes of a General Meeting of the Amateur Wireless Society of Victoria held in the Oxford Chambers, Bourke Street, on 5th December, 1912.

The WIA have three main papers for this Conference to date. An Intruder Watch document which could prove difficult "to sell" in the light of the WIA apparently being the sole interested party in intruders throughout the entire region. A well documented up-to-the-minute paper about the need for international uniformity of frequency allocations in the VHF/UHF region by the Chairman and members of the Institute's VHF/UHF Advisory Committee is the second of the three papers and ideally is aimed at Administrations rather than other amateurs who need little convincing about this (e.g. Malaysia and absence of the 2m amateur band). The third paper is a report by myself as the WIA delegate.

Tom Clarkson's reports about the 1971 WARC are of course exceedingly bulky and much of the material has already been adequately reported over the years since then. Tom Clarkson also produced proposals for consideration by the R3 Conference for strengthening the Amateur Service influence in the right directions for WARC 1979. Tom suggests, *inter alia*, that during 1976 and 1977 a personal call should be made by the IARU President (or Deputy) upon the heads of all the Radio Administrations and this should be sought and arranged by the national Society.

A report by Michael Owen VK3KI, one of the Directors, supports Tom Clarkson's proposals with a number of detailed suggestions to aid in implementation.

I am looking forward to this Conference as your appointed representative but I feel a little disappointed that although WIA Divisions, were specifically asked to send material forward to help me at this Conference but the response was noticeable, poor.

Let us wish the R3 Association well for their Conference which may well be crucial for this part of the world in the next few years.

D. A. WARDLAW VK3ADW
Federal President

EMERGENCY COMMUNICATIONS IN PERU

"It (the Regulations dealing with radio amateur activity) also lays down that all radio amateur stations must be permanently operational in the 40 metre band so that they can be called upon at any time to take part in the emergency service". Radio Amateurs column in the Telecommunications Journal, Oct., 1974.

70 CM DRAFT BAND PLAN

Are you active on the 70 cm band? If so, have you sent in your comments on the proposed 70 cm band plan as printed on page 9 of AR Oct. '74? If not, do it now or be forever silent, as the saying goes.

QSP

WENTWORTHSHIRE BUSHFIRES FROM DECEMBER 27th

A note from Geoff Syne, a WIA member in Pooncarrie, gives some details of communications operations carried out by a number of various operators, including the Shire President, Jeff Whyte VK2AHM, using equipment loaned by the NSW State Emergency Services. He commented that the size of the shire makes VHF impracticable without the use of repeaters and that almost all fires in the area are started by thunderstorms late on a summer's day makes HF contacts almost impossible during the initial period of fire fighting. Also he said that most of the fire fighting is done during the night because the fires tend to be quite uncontrollable during the day. He concludes that VHF is essential in areas around a fire especially as HF gets very difficult at night unless portable aerials can be strung up high enough and greater power is available.

AR AWARDS

The Publications Committee announce the following awards for the year 1974 —
Higginbotham Award (worth \$50) to Eric Jamieson VK5LP for his splendid work in continuing his interesting VHF/UHF column.
A.S.A. (Pique and \$10) to Don Marshall VK4ZAF for his article "The Brisbane Valley Flood Disaster" published in April AR.

Technical Award. Because so many articles vied equally with each other for first choice the Committee felt unable to select any particular one as more outstanding than the others for the purposes of this Award (worth \$25).

MORE STATISTICS

Radio Communication for Nov. '74 contains a chart which shows that the income of the RSGB for the year ended 30th June 1974 derived from subscriptions 53 per cent, book sales 34 per cent, advertising 11 per cent and sundries 2 per cent; whilst expenditure for the same period went out at 43 per cent production cost of Radio Communication, 25 per cent cost of books, 21 per cent salaries and wages and staff costs, 8 per cent all other items and 3 per cent surplus. The comments in Council's Report about "Radio Communication" are that this is RSGB's largest single outgoing (and to it should be) and would cost

more if it were not for the considerable savings achieved by forward purchasing of paper, combined with judicious juggling of paper weights and pages per issue to make the most economical use of postal rates. It seems that AR is not therefore unique in the way we also must juggle!

OVERSEAS LICENCE FEES

Taking the old \$6 as a yardstick, what major countries charged more for the annual amateur licence renewal? Nearly all the communist bloc countries made no charge, but of the others with amateur populations exceeding Australia's, the fee was greater in Canada, West Germany and France. The most expensive licences were apparently Belgium, Ivory Coast and Austria, which were well in excess of our present \$12. Spain, at 15 cents per watt, was an interesting variation since there was no apparent upper power limit. Other countries which had licence fees in excess of our new rate included Switzerland and Lebanon.

2m BAND IN U.K.

"I am afraid it is not yet possible to allow amateurs full access to the 144-145 MHz segment, but the aeronautical assignments have been reduced to the three frequencies 144.0 MHz, 144.54 MHz and 144.9 MHz. We cannot say when these remaining channels will be given up and amateurs must continue to avoid them". Extract from a letter from UK Radio Regulatory Division quoted in Mobile News, Oct. 74.

CW NETWORK PROGRESSES

Founded about two years ago by Frank (VK4II), the CW Net is now a regular each Sunday morning on 7 MHz. At the time of writing, the net has functioned 87 times, and has drawn into its ranks a large number of expert CW operators. These men are firm believers in the permanence of telegraphy in a world where technological complexity is often developed for its own sake, or for commercial reasons.

Till recently the Net Controllers have come from either VK2 or VK4, but on Sunday January 5th, a Victorian, VK3XU, conducted the net for the first time and in a most effective manner. Draw handled the necessary QSOs for eighteen amateurs during a two-hour session, and repeated the performance on the following Sunday. And when one considers that each station would average about three contacts per session, this represents a considerable amount of work.

The net is there to be used by anyone reasonably proficient in CW operation. It will be found on 7055 kHz at 1000 hrs EAST on Sundays.

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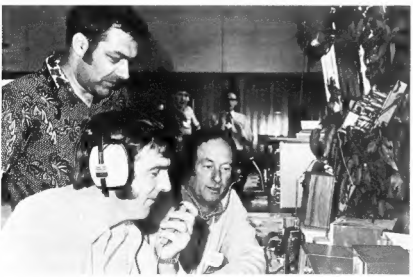
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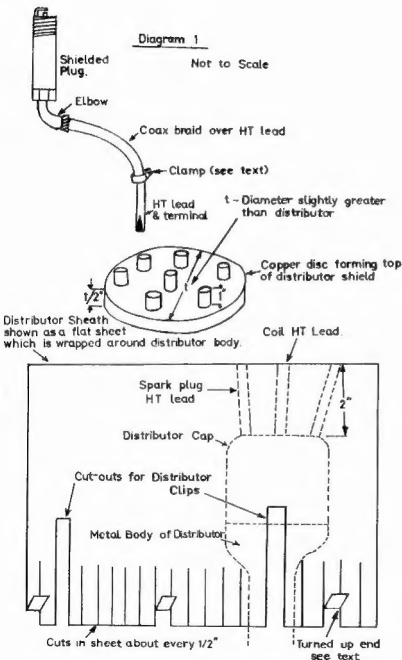
Operators (l to r) at the VK7 Divisional Hamfest were Bob VK7ZJS, Tony 7AK and Ken 7KH. This was the first hamfest organised by the N.W. Branch and was held on 16/17 Nov. 1974 in the Turner Beach Hall, 8 miles west of Devonport. A number of social activities (including a fashion parade of night attire) were greatly enjoyed by the 80 or so adults attending. Photo courtesy The Advocate of Bumsie.



Peter Williams, VK3IZ, has recently been appointed general manager of newly-formed VICOM International Pty. Limited. Peter (known around the traps as "IZ") has been active in WIA Federal, State and International affairs and until recently managed the Australian Electronic subsidiary of the Schaeffer Pen Group.

Diagram 1

Not to Scale



The noise created by the ignition and other electrical circuitry of the common automobile is well known, and well cursed, by the amateur who has tried mobile operation. Some, of course, have been frightened off by the apparent problems involved in suppressing a vehicle. I intend to show a few methods of suppression from the easy to the much more laborious methods.

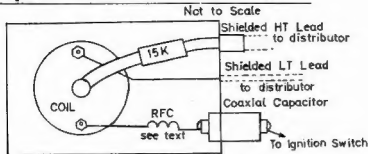
There are three easy methods. Firstly, if you are wealthy enough, you can buy a diesel powered car. A diesel produces no interference. The second method is to switch off the motor of your car whilst you are mobile. This is hardly practical and additionally is dangerous with the latest cars which have steering locks. The third method which may or may not be feasible is to wait for the introduction of the steam driven car. For the average person none of these easy methods is practical, so I will concentrate on the laborious but effective methods I have tried myself.

One of the first things that I found out when doing extensive experimentation on the suppression of spark ignition engines was that it would be a long job if the right techniques were not used. The final conclusion that I came to was that **THE WHOLE OF THE INTERFERENCE CAUSING SOURCE MUST EITHER BE SHIELDED COMPLETELY OR HAVE SUPPRESSION FILTERS FITTED WHERE SHIELDING IS NOT PRACTICAL.**

The Ignition system of a car must have the whole of the HT spark system shielded, and this includes spark plugs, HT spark plug leads, distributor, connecting wiring to the coil, and the shielding of the coil top. The low tension lead from the coil is filtered because it would convey interference to all sections of the car as it is integrated with the rest of the wiring. It is also much easier to filter this lead. There is no practical method that I know of, of filtering completely the HT spark system. The carbon trace leads fitted to most new cars when new, do reduce interference quite considerably. Regrettably, many car owners and ignorant garage mechanics treat suppression leads as if they are the prime cause of engine trouble. They do give suppression figures of up to about 25 db over an unsuppressed vehicle ignition system.

Having made my point in regard to the general philosophy of suppression, I will describe two methods of suppression. The

Diagram 2. View of coil from top of shielding box.



first has been reasonably successful on the HF bands but not particularly so on VHF. The second method was a lot of work but is very good at MF, HF, and VHF, and should be reasonable at UHF. I don't claim that what I have done is necessarily original, but this style of thing has not been published in AR for many years, if ever.

METHOD ONE

At one time I was involved in the Emergency Fire Services of South Australia and the Country Fire Authority of Victoria. I was concerned with communications, particularly the communications to and from my mobile. I used a No. 122 transceiver and these are not blessed with a noise limiter as such. I didn't bother modifying the set so I had to do something about the noise from the ignition system of the FE Holden.

I had quite a bit of old half inch coaxial cable so this formed most of the raw material source for the suppression. The cable was stripped down to its components. The only section used was the coaxial braid. It was cut into lengths that suited each individual plug wire and a length to suit the HT line between distributor and coil. Each of these tubes of coaxial braid was slid over the appropriate distributor-plug lead. The ends of the braid were trimmed away from the plug at one end and the top of the distributor lead rubber gaskets, so that no arcing from the HT system to earth occurred. At each plug end a braid lead was soldered on and extended to the rocker cover where it was earthed. At the distributor the seven braids were bonded together. At the coil end of the distributor-coil lead the braid was bonded to the coil frame. FE Holdens do not have resistive HT cable so I fitted one of the 15,000 ohm resistive suppressors in the coil-distributor lead. This concludes all the information on the shielding of the HT system.

The coil LT lead had a 0.5 uF 40 ampere coaxial capacitor fitted in the ignition line at the coil. These are much better than the normal suppressor used for car radio suppression work, even though three times the price. The generating system of the vehicle also required attention. The output and field leads were shielded, like the HT line, from the generator to the regulator. The output lead to the battery was

filtered with a coaxial capacitor, 0.5 uF 40 ampere. The field terminal of the regulator was bypassed to earth with a series combination of a 5 ohm resistor and a 0.001 uF mica capacitor. The coaxial capacitors must have their frame lugs bolted directly to the frame of the vehicle. The idiot light line was suppressed also, this time with a series RF choke situated at the regulator. The RF choke used was a LT choke from an old Astor vibrator car radio.

I could now work mobile to base distances of 25 miles whilst mobile which I certainly could not do before. If the set had had a noise limiter no doubt this range would have been even greater. The output power of the base was only of the order of 5 to 8 watts so I believe this was a credible performance. I found it most desirable to have the aerial on the rear of the vehicle to get as far away from the engine as possible, and so escape whatever interference still remained. I bonded the engine to the firewall with a heavy earth strap such as used on batteries and did the same to the bonnet. How desirable these were I am not sure. I do know that the noise at VHF emanating from this vehicle had to be heard to be believed — it could be heard a block or so away — and other vehicles were not

audible.

With later types of vehicles which have a rubber sheath over the spark plugs it is likely that the braid shield can be extended down onto the top of the plug which is partially recessed into the engine. This may improve VHF suppression. If you do this style of suppression you will probably find that the ignition timing has changed and may have to be advanced or retarded: I cannot remember which.

METHOD TWO

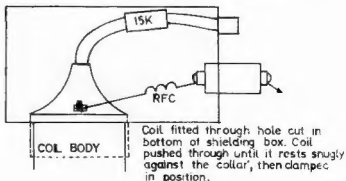
If you really want to have your vehicle suppressed so that a sensitive AM receiver at a few feet hears no interference — then this is the method for you. A vehicle suppressed using this method should not have any trouble passing the Society of Automotive Engineers interference specification SAE-J551. The vehicle suppressed in this case was a 1970 Ford Falcon.

There was a lot of blood, sweat and tears shed during this project before success was ours. This was not originally my project — my boss decided that he wanted his vehicle suppressed so that any receiver, AM or FM, could be operated in the vehicle on any frequency from the broadcast band to a couple of hundred megahertz. This was to be on a set with no noise limiter. Some task!

The ignition system was to be suppressed along the initial lines of method one only in a more thorough manner. The carbon trace HT spark plug lines were removed — not because we didn't like them, but because they would not suit the end terminations we would use, and they were too short. The distributor was to be completely shielded, and some interesting metal work evolved during the exercise. A metal disc slightly larger than the diameter of the distributor formed the basis of the distributor shield. This had a half inch lip bronzed to it, and through the top of the disc 6 equally spaced holes were drilled around the disc. The holes were large enough to take normal wire cored ignition HT wire. Six tubes each one inch long able to take these cables were bronzed around the circumference of the holes.

Diagram 3 Side view of coil shielding box

Not to Scale



An additional note for the coil-distributor HT lead was bronzed to the centre of the disc. You may have realised this was a six cylinder engine.

Around the lip of the disc was wrapped a piece of 26 gauge galvanised sheet steel and this extended down past the distributor assembly. It was held in place onto the lip of the disc by a large hose clamp. Underneath the distributor another clamp was fitted and this was intended to draw the metal of the sleeve close into the distributor housing. To facilitate this drawing in of the metal, slits were cut vertically in the metal so that adjoining pieces of metal would fit under one another. It was found necessary to turn up a few of the ends of the metal strips so that they would prevent the clamp from slipping off the metal sheath. This must be fairly tight otherwise RFI leaks out from the small gaps underneath the distributor. There were two slots cut in the metal sheath to allow access to the distributor cap clips. All of this can be seen in diagram 1.

The HT leads extend through the disc mounted above the distributor. The disc is mounted about 2 inches above the top of the distributor cap. The HT lines are covered with heavy duty coaxial cable braid as were the leads in method one. We had no shielded spark plugs so the braid was extended as far down the spark plugs as could be achieved. The spark plug leads all had heavy rubber sleeves over them on the ends where they attached to the spark plugs. The braids were all bonded to the rocker cover near each spark plug. The coaxial shield braids were clamped onto the tubes protruding from the top of the disc on top of the distributor. Small screw type clamps available from Ford dealers or the smallest size hose clamps were used to do this job.

The HT lead from distributor to coil was also shielded, and clamped in the same way. A small metal case was made to go over the top of the coil. Access to the coil was gained by removing a small panel from this case. The HT lead outlet on the case was the same as the tubes on the top of the disc over the distributor and the braid was clamped in the same way. A 15,000 ohm resistive suppressor was placed in the HT lead. The coil to distributor LT lead was also shielded using a thinner coax braid. The braid was earthed at the coil and the distributor.

The ignition switch volt 12 active lead to the coil was filtered with a variety of L and C. A small balun core as used in many TV sets was used to wind a small VHF choke. Two or three turns of single core hook up wire was used through the two holes in the core. One end went to the coil LT line the other went to a 0.5 uF 100 ampere coaxial capacitor. The capacitor output end should be the only terminal of the capacitor visible outside the case. The filtered end of the RF choke should be very short as the capacitor may not be completely effective at VHF. **Robert Bosch (Aust.)**, have some quite elaborate filters for this job — complete pi networks

in the one metal case. The filtering is quite effective.

After all this hard work success should have been ours — it wasn't. At VHF in particular there appeared to be virtually no noise reduction — it was enough to make a grown man cry. What was wrong? Hadn't we done something we should have? What was wrong with our reasoning? We were at a loss. We thought it may have been the bonding of the vehicle itself. We had all the mudguard panels spot welded every 3 inches to the engine compartment; we had the back edge of the bonnet bonded every 3 inches to the fire wall; we had the bonnet cleaned of paint so that it would make metal to metal contact with its hinges and bonding straps; we had the whole of the engine bay, engine mounts and exhaust pipe bonded with zero success. This is probably the stage that many people get to and give up — and I wouldn't blame them. After all this work we were not going to give up. We were going to succeed, and succeed we did.

Initially, we had been unable to obtain shielded spark plugs and these had now become available. **KLQ-Lodge** are the only manufacturers of aircraft style shielded plugs that I know of. We obtained a set of these complete with elbows, fitted them and then listened to the glorious hiss of the receiver when the engine was running, no ignition noise. We did hear ignition noise though — that of passing cars but not ours. The type numbers of the shielded plugs I believe from memory is the same as the plugs that you may be using at the moment, only they are prefixed with the letter S. Shielded plugs are only made to order, I believe, and take about 2 weeks to come through. These plugs cost about 3 times as much as ordinary plugs and the elbows cost about the same as the plugs.

The alternator and regulator also had to be suppressed. The leads from the alternator were all shielded except that the battery lead had a coaxial capacitor wired in series with it and was unshielded. Two more coaxial capacitors were fitted to critical leads from the regulator but I cannot remember which. Later regulators will not require these extra capacitors. The shields must of course be earthed at each end for the shield to be effective. The instruments on the Falcon are fed via a small voltage regulator and this causes noise. Dismantle the instruments and inside either the fuel or temperature gauge will be found a small bi-metal regulator. A small 0.05 uF or similar ceramic capacitor is wired from active to instrument case on the outside and another inside from the regulated line to earth. A small ferrite core RF choke having about 3 turns of wire through it is wired in place of the pink interconnecting wire in the instrument. This got rid of the pop that was heard every second or so in the receiver. Perhaps not all that annoying, but if suppression is going to be worthwhile the job may as well be done properly. So ends the saga of the suppression of two vehicles. The 3 diagrams will help

you should you wish to try out this method. Another Falcon was suppressed identically to the first with complete success, so it wasn't just luck.

COMMERCIAL SUPPRESSION METHODS

For those who wish to suppress their vehicles but do not wish to go to the trouble that we had done in the previous method I would suggest you contact firms such as **Robert Bosch (Australia)**, who do specialised work on vehicle suppression. I have seen some of the suppression equipment used and it is quite impressive. It would take under an hour to completely suppress an average 8 cylinder car. The bits and pieces are easily removed when the car is traded in and may suit the new car with slight modification. These suppression kits are not cheap, but I can see them becoming more common as people realise their value in improving mobile communications.

In the United States of America a variety of suppression kits are advertised from time to time — these may be suitable for use here in Australia but this could not be guaranteed. In the March '74 issue of **Ham Radio**, page 63, a book called **Eliminating Engine Interference** was described. I have not seen this book, but from the write-up on it would appear to be an interesting and informative book. Being an American book I am not sure how it should be ordered — Maggubs, or one of the book shops who advertise in AR?

SETS WITH NOISE BLANKERS

Many people will say that suppression is not necessary on a vehicle if you have a noise blanker fitted to the receiver. This is not strictly so. The noise pulses can be of such amplitude that they overload the front end of the receiver. The end results of the high amplitude pulses can be de-sensitisation of the receiver, cross modulation and in some FM receivers, where the IF selectivity curve is asymmetrical, the noise pulses ride through. The noise blanker is a very handy addition to a receiver but does not replace suppression of the ignition system.

QSP

VHF PROPAGATION

This is only one of the ways amateurs can justify the portions of the spectrum we occupy — by contributing to the basic understanding of VHF propagation. Conclusion of an article "VHF's View of Solar Cycle 20", in **Ham Radio**, Dec. '74.

1976 OLYMPIC GAMES

According to **RASO** (Radio Amateurs serving the Olympics) the 1976 Olympic Games are in Montreal during the summer and **RASO** intend to organise Canadian amateurs for active participation in permitted facilities of communications not contrary to third party traffic prohibitions.

USA PACIFIC ISLANDS LICENSING REGION 3

Looking at the U.S.A. dependencies in the Pacific it seems that Guam comes under the F.C.C. and there is an amateur radio club on the island which is not affiliated to the I.A.R.U., except possibly through ARRL. This appears to be the pattern in many other U.S. islands and does not of course hold the Region 3 Association in any way. Others of the U.S. Pacific Islands — i.e. the Trust Dependencies — do not appear to come under the jurisdiction of the F.C.C. and no reciprocal licensing arrangements are in force for these areas. In a similar manner it seems that any amateur radio societies on any of these islands also could not join the I.A.R.U. direct.

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some useful modifications to the FT-101 series

The following are modifications which have been made to a FT-101B transceiver. In each case there is no external change and if desired the unit can always be returned to its original state should this ever be desired.

The author has always been of the opinion that unless some very beneficial improvement occurs, it is unwise to make external changes to good commercial equipment as this will almost certainly reduce resale value. Note that these modifications were made to an FT-101B, and due to slight internal layout changes it may not be possible to fit the fan relay (see modification 3) to the FT-101.

MODIFICATION 1

As supplied, the transceiver showed a tendency for RF feedback when using an external speaker, RF being picked up by the speaker leads. This was cured by the addition of a 0.01 uF 50 volt ceramic capacitor across the external speaker jack (J 12), connecting the capacitor from the green lead to earth.

MODIFICATION 2

When operating VOX it is often desirable to be able to hold the Tx on for short periods without having to continue speaking to do so. As supplied the PTT is inoperative in the VOX position. By bridging S7 (MOX-PTT-VOX selector) the Tx may be held on during VOX operation by pressing the microphone PTT switch. When this switch is released, VOX operation returns to normal. If the PTT switch is not pressed there is no change from normal VOX operation. A link is placed between the moving arm of S7 and the centre PTT contact so that PTT is available at all times. I did this by carefully placing a bead of solder across the contacts which are adjacent, filling this a short piece of

wire can be used. Care is required to prevent heat from the soldering iron damaging surrounding wires and components. To make the job easier I used an instrument tip on my iron overlaid with a simple extension made of 16g copper wire which provided sufficient heat in the confined space to solder the link.

MODIFICATION 3

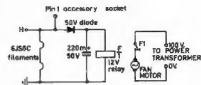
When using the FT-101B with a VHF converter, or during long periods when the heaters of the 6JS6Cs are turned off, it is quite unnecessary for the fan to continue to run. Under these conditions the only source of heat is the 12BY7A driver tube which produces very little heat at any stage. The noise produced by the fan can become irritating during long periods of listening and can even tend to mask very weak VHF DX signals. In addition, considerable amounts of dust accumulate in the final cage over a period of time as a result of the volume of air passing through it.

The addition of a relay in the fan supply circuit operated from the filament line of the 6JS6Cs enables operation of the fan to be limited to periods when the tubes are heated. The critical component is the relay. This must be physically fairly small, a 12V type, and capable of switching 100 volts at 0.09 amps. If a suitable type can be found, a reed relay with a 12 volt coil could also be used. Remove the bottom cover plate from the transceiver and check the available space immediately below the electrolytics.

In the author's case, there was sufficient room to fit a small relay on a bracket which was attached to the side of the frame surrounding the power transformer. The dimensions of the bracket and its exact location will depend upon the type of relay used. Ensure that there is adequate clearance from all surrounding parts. Trace the fan supply leads back to the power transformer and unsolder the white lead attached to the 100 volt terminal. Connect another lead to this terminal and then run both leads to the relay contacts, connecting them so that with the relay disconnected the fan circuit is OPEN. Next take a lead from pin 1 of the 11 pin accessory socket and connect this to a spare contact on the relay or a tag strip mounted on the chassis. From this lead connect a diode to one side of the relay coil, connect a 220 uF electrolytic across the relay coil and earth the other end.

Make sure that correct polarity of the rectifier is observed as this circuit must cater for 12 volt DC operation as well as 240 volt AC mains operation. When used on 12 volts DC, the diode conducts and allows the relay to operate. A far simpler way of controlling the fan would be to place an on-off switch in the 100 volt line, but this could easily be forgotten. The

Geoff Wilson, VK3AMK
7 Norman Ave., Frankston, Vic., 3190



relay circuit is completely automatic and ensures cooling of the final tubes whenever they are used.

NOTE: Some relays may run hot under continuous operation if the voltage exceeds 12 volts. If so reduce the coil voltage by adding a parallel resistor of suitable value and wattage. It is not recommended that this principle be used with the FT401 etc. These transceivers have many valves and continuous cooling is desirable, especially in hot climates.

QSP

W.A.R.C. 1979

The fact of the matter is that in these times the voting strength of the ITU is controlled by several blocks of developing countries in South America, Africa and the Middle East. The League is already embarked on a programme of "selling" amateur radio in these sometimes hostile areas, working with other societies in the IARU. In the months ahead there will be more extensive travel by HQ staffers and by ARRL and IARU HQ officers and by the representatives of the regional IARU divisions. In addition we are calling on the services of those amateurs whose business travels take them into critical areas and who have the linguistic skill and the knowledge and enthusiasm to bolster the amateur cause. QST Dec. '74 Editorial.

THE FUTURE OF THE SOCIETY

The RSGS Council as reported in Nov. '74 Radio Communication had been discussing the future of the RSGS and the outcome appeared to be that the Society must now seriously consider the administrative and economic aspects of a move from London: there must be far greater encouragement to younger members to participate in the Society's affairs and it must do far more to publicise the work that it is doing. The WIA no doubt will also be busily considering its own finances in 1979 judging by comments which came in from some members along with their subscriptions this year.

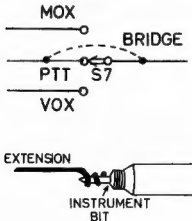
MOBILE DX

During a recent trip to the Northern part of Queensland, VK2AOK found that a sure way to radiate a good signal on 14MHz at about 0930 EAST, was to transmit from the centre of the Jardine River, 38 miles from the top of Cape York.

All of the operators on the frequency at the time from as far south as VK0, were greatly impressed by the increased signal strength as the river was crossed.

The river at this point is approximately 350 metres wide and at least 1 metre deep.

The mobile station used a Japanese transceiver and a small 20 metre vertical antenna mounted on the front mudguard of a Land-Rover.





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a twelve months study of the 20 metre band between melbourne and london

On the 14th November 1973, Jim G4BGJ, South London, and myself VK3LY, Melbourne, commenced a series of chats on the 20 metre band which in effect continued intermittently for the complete 12 months thereafter.

Everything was going along nicely when about the middle of May 1974, the band went out completely in Melbourne, which of course I had done on previous occasions. However, this particular occasion differed from its predecessors in that it continued to stay out and was now declared extinct. Somehow the band could not appreciate that Jim and I had been in regular contact either in the afternoon or evening (at the Australian-end) for about 6 months. But no matter what my feelings were on the matter the band itself could not care less and like the river just continued on its way.

By this time I of course was beginning to realise that Jim in London would be considering me a very discourteous type of individual — you see I had not told Jim that I would not be back! It occurred to me that if the band itself was not concerned about this lack of courtesy then I most certainly was and so set about finding a way of predicting the irregularities of the mode of communication I had chosen. The idea of a chart occurred to me. Not an ionospheric prediction chart, but a chart which displayed the behavioural pattern of any selected band.

I probably have always been fascinated by the regularity of the passage of the earth in orbit around the sun. Further I have always been fascinated by the fact that the sun shines through the same hole in a centaph onto the same spot each year at precisely the same time as the previous year. I was further fascinated by observations I had made over a couple of years while being a 4th floor employee in a 19-storey building noting the short shadow cast by our building in Melbourne on the 21st December as compared with the very-very-long shadow cast on the 21st June each year. Of course we had learnt of this at school but this was now taking on an added realism, as at the window at which I worked I was able to observe at my leisure and observe I most certainly did.

We are told that above us is an ionospheric region situated somewhere between 50 and 300 miles up. We are also told that this ionosphere is affected by the emission from the sun causing the ionosphere to form a system of layers as our earth rotates. Of course planet earth is not a fixture — it does various things at the one time — it rotates on its axis once in 24 hours — it also travels on an orbital path around the sun completing this journey in 365 days. Well so far it seems as though we have no problems

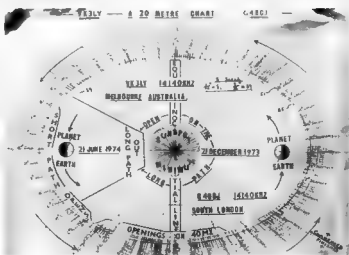
and that all is plain sailing — until we realise that the earth amongst other things, is tilted on its axis by 23 degrees, and this alters the whole situation. One is forced to admit that this trick is tremendously ingenious however, for we have now introduced a system of seasons — summer, autumn, winter and spring. You see now the plot thickens because the poor ionosphere doesn't know whether it is coming or going so to speak — for as stated the earth is rotating and continually presenting a different face to the sun. And because the earth is following an elliptical path it is always at a different distance from the sun to that had it been only on a circular orbit, where at least it would have always been at the same distance from the sun. So much for the complexities which initiated the idea of the chart.

The chart itself was produced by drawing an ellipse with a looped piece of string and two drawing pins. Try it for yourself — put the pins about three or four inches apart, place the string loop over them, now with a ball-point pen or pencil strain the string loop slightly and following the perimeter draw out an elliptic type path. The ellipse itself is then divided into quarters and subdivided until the segments are reduced to the chart as illustrated. One end of the ellipse was elected as representing the 21st December and the other end as the 21st June, while the 21st March and the 21st September are at their usual positions on the equinox line, or equinoctial line as listed on the chart. From there on divisions and date lines follow evenly. The principle applied was that there are 360 degrees in a circle and 365 days in a year — near enough for one degree to equal one day.

Ron Schmidt, VK3LY
73 Rowell Ave Camberley, 3124

All of the G4BGJ signal strength readings recorded on the chart were taken on the long-path, our normal communication path for that time of the day. The few readings taken on the short-path were from other G stations. The length of the lines drawn are scaled to represent the signal strength of the station being received. S1 being a dot 1/16th inch long, S5 being 5/16th inch and S9 being 9/16th inch long. A line drawn from the perimeter away from the sun in the centre of the chart indicates a long-path contact — whereas a line drawn in towards the sun from the perimeter indicates a short-path contact of which a few only are recorded, there being very few short-path loggings as compared to the long-path. Times are shown as Melbourne time and are listed as Eastern Australian Standard Time (EST) which is 10 hours ahead of Greenwich Mean Time or conversely GMT is 10 hours behind EST. Where no contacts are recorded this is because no signals were coming into Melbourne from G land due to ionospheric disturbances caused presumably by solar flares or solar storms, both associated with the manufacture of a sunspot — be it ever so humble. Some of the solar disturbances put the band out of action for 10 days — another lot for 19 days — thereafter in Melbourne was to occur the longest band drop-out of 72 days or 2½ months, that was from 17th May 1974, until the 29th July 1974. This was on the long-path and the frequency was around 14140 kHz and in the normal time region of band openings between 0500 GMT to 1000 GMT, the times in this

Below is a reproduction from a colour slide of the chart prepared by Ron VK3LY



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segment being of particular interest and were charted accordingly. There was an occasional opening to Spain or Southern France in that time — but to G land — well if you look at the chart you will see an occasional working but it seemed to an exasperated operator in Melbourne, that "never" would have been a nearer truth.

The shortest QSO between G4BGJ South London, and VK3LY Melbourne, was for about two minutes — time only to exchange call signs when the band faded out. However, that was only on one occasion. The longest QSO occupied us for something like 2½ hours. The average QSO on SSB would have been for about 1½ hours which would also have been about the length of the band opening. SSB was the normal communication mode used. Transceivers at each end were FTDX 401s plus a linear at the G end. Antennas were, at G4BGJ a Mustang Mosley at 40 feet while at VK3LY a 2 element home-brew tribander at 22 feet was operative.

A comparison of charts drawn up by keen amateurs around the world would certainly be most revealing. A chart comparison taken between the Australian cities on the Eastern coast would in themselves be a revelation in displaying the variations of the band over a similar path to any country the amateur operators so elected. This project would call for quite a discipline for the twelve months in that those conducting the experiment would require to be in attendance at band opening times for the sake of recording or not recording on the chart, whichever it turned out to be for that day or night. As stated, a chart comparison taken on the same band around band-opening times at Brisbane, Sydney, Melbourne and Hobart in Australia in itself would be tremendously interesting as each of these capital cities are almost on similar longitudes while differing satisfactorily in latitude for the exercise. The times given on the chart purport to be band-opening times. These became very accurate as the operator became adept in recognising and observing the opening to G land. The commencement date for the taking of readings was the 14th November 1973, and the final reading was the day before that date in 1974. I define the band-opening time as being that time at which the G station became readability 5. On first hearing the G station, the time and signal strength is immediately logged together with the dial frequency-reading, being recorded on scrap paper initially for comparison purposes while scanning the band, the final signal strength being recorded on the chart; in short you sample the band.

Because of the rotation of the earth from west to east the New Zealanders hear the G stations open before the VK3 stations. As a result of this it is not uncommon to find yourself listening to the ZLs working the Gs for perhaps a ½ hour or so before the Gs are even being heard in Australia. This in itself is an interesting experiment in that it makes it easy to hear the birth of a G station from nil heard,

to the eventual final signal strength at which that particular signal is going to settle down. Only temporarily of course, for the life of a DX signal on the high-frequency bands is normally of a very temporary nature. The birth of the incoming signal when it starts can be from 2 minutes to perhaps 10 minutes before it reaches its maximum signal strength, its final strength being predetermined by conditions associated with the ionosphere, power into the antenna at the transmitting end, and the antenna height and gain. At the receiving end we have exactly the reverse situation except that the receiver takes the place of the transmitter. This of course presupposes that locations are normal and that directional antennas are being used for best DX communication purposes and are of course beamed correctly towards one another.

From the series of observations taken in constructing the chart it became obvious that the boys around Sydney were generally able to contact G land slightly earlier (because of the slight longitude difference) and more frequently than their counterparts in Melbourne. This applied particularly when solar activity was having an adverse effect on the band down Melbourne way; it was not uncommon under those conditions to hear the Sydney boys working and giving the G stations normal signal reports. Under those conditions of course the more southern VK3 knows instinctively from his acquired experience of the band that this is not his night. However, this is not necessarily the end of things for it is not uncommon for conditions to change slightly and favour the VK3 more than previously.

In summarising the advantages of this particular type of chart over the normal ionospheric prediction chart I would say that this particular chart provides the operator with:—

- (i) a fuller comprehension of the band by providing a better understanding of its behavioural pattern,
- (ii) an indication of temporary band drop-outs of a periodic nature,
- (iii) indication of winter (at the Australian end) band drop-out as well as an indication of a return to continuity of communication for the remainder of the year,
- (iv) a rough prediction of probable repeat performance for guidance purposes for the following years, or year at least,
- (v) a once in your life comprehension of the band under observation.

Statistically on the chart there are 130 contacts with G4BGJ, 32 G contacts not G4BGJ, plus 12 G stations heard with signal strengths recorded, altogether making a total of 174 recordings. These in their turn produced the final chart. The chart shows an average of one contact every second day throughout the year, remembering that there was a time during the winter months at the Melbourne end when signals stayed out for 2½ months; although a rebirth was around the corner and patience was to eventually win the day.

On discussing the chart with a Canadian who enquired about the principle on which the chart was established, I repeated the opening story of the cenotaph, which brings us back to a repeating cycle of events. In short if there was no sunspot activity ever to cause magnetic storms then the band would not go out as spasmodically as it now does, and you would be left to presume that you would have an even flow of communications at the normal contact times. It should be noted that the solar storm does something else which is not immediately obvious — as stated the solar storm—causes the upset in the ionosphere and the result caused by the upset may take place for perhaps 10 days, after which the ionosphere resettles — but here is the point — it now resettles not at the point where it was before the band went out, but resettles at a point which is in direct accordance with the earth's new position on its orbit in space around the sun. If there were 10 days of disturbance the planet earth would have travelled 16 million miles further on its elliptic-path journey and the result of this is that the band would now come in earlier or later than that where it was before the sunspot disturbance under discussion (which produced the resulting magnetic storm). Whether it is earlier or later depends upon whether the earth is heading datewise towards the 21st December which is the longest day at the Melbourne end or the shortest day at the London end and which is recorded on the chart as the 17th December (possibly due to the tilt of the earth's axis from the vertical). For the purposes of straight reading it would be better to put aside this slight discrepancy as that type of change can be a separate study in itself. Let us proceed. On the chart as you approached the 17th December the band in Australia opened to G land later, opening in London also later, for the length of the piece of string holding London and Melbourne together for the purposes of this exercise, does not alter, the band opening being now around 1000 GMT; conversely, as the earth moves away from the 17th December towards the 21st June the time of band opening becomes earlier — i.e. 0530 GMT with the intermediate times of opening being proportionally distributed along the intervening date points on the chart. Inserted on the chart you will find references to 40 metres and an occasional reference to 15 metres. Please consider these as extras in terms of G land openings to Australia and they were not really associated with the main project, that of course being the study of the 20 metre band only.

Having now completed the elliptical trip around the sun on planet earth and having covered something like 583 million miles you now may have a better appreciation of the digestive troubles had by the ionosphere in endeavouring to adjust to its changing surroundings; in spite of everything, the band does have a tremendous element of logic despite a seeming multitude of inconsistencies. ●

WVLF UHF an expanding world

with Eric Jamieson VK5LP

Forrester, S.A. 5233

Times GMT

AMATEUR BAND BEACONS

VK0	VK0MA, Mawson	53.100
	VK0GR, Casey	144.200
VK1	VK1RTL, Canberra	144.475
VK2	VK2WI, Sydney	82.450
	VK2WY, Sydney	144.010
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.600
	VK4W1, Mt. Mowbellan	144.400
VK5	VK5VF, Mt. Lofy	53.000
	VK5VF, Mt. Lofy	144.900
VK6	VK6RTU, Perth	82.300
	VK6RTU, Kalgoorlie	82.350
	VK6RTW, Albany x	82.850
	VK6RTW, Albany x	144.500
	VK6RTW, Albany x	145.000
VK7	VK7RTZ, Cooberpedy	144.700
P29	P29GA, Lee, Nugini	82.150
3D	3DA, Suva, Fiji	52.500
ZL1	ZL1VHF, Auckland	145.100
	ZL1VHF, Waikeia	145.150
ZL3	ZL3VHF, Wellington	145.200
	ZL3VHF, Palmerston North	145.300
ZL4	ZL4VHF, Christchurch	145.400
	ZL4VHF, Dunedin	145.500

x denotes add'l ton

Beacon news this month shows the new Albany 6 metre beacon with a listing on 52.950, and reported heard by Kerry VK5BU at Ceduna. It uses a 5W CW, was 5 watts output, presently on a 5 element beam pointing east, but an omni-directional antenna is planned for the beacon. No news has been heard of the Darwin beacon VK6VF since the cyclone so it can only be presumed to be lost along with so much other damage, and I guess there are more important things to do in Darwin than there is to worry about the beacon. However, possibly something will be heard about it by the time the next DX "season" comes around at the end of the year.

DX MEMORIES

This band seemed to be behaving in a somewhat unusual manner this "season". Excellent early openings were observed to all States in Darwin, but a frequency indicating something was going to happen early. Possibly the best way of going over activities would be to pick out some of the highlights as I saw them, and with some news from other areas to complete the picture.

One of the highlights would have been the copying of the beacon 3D3AA by VK4WV and VK2ZAH on 24th November for 15 minutes with a gain 5 x 3. Distance would be over 3000 km. About this time news came to hand that VK6VF the Darwin beacon was operating as a transponder and was capable of giving signal reports back to the calling station. 18172 Rod VK2BJZ (ex ZQJ) reported d'gling in the garden — consequently missed working ZL4S. John VK4ZJB worked some JAs on the 1 day. 2612 all ZL districts + to 4 worked 2712 VK2ZAH heard 3D3AA beacon, and later worked VK2BKE on Lord Howe Island, who was using an FT200 driving FTV550. Jim VK5ZMJ also worked VK2BKE. Good work chaps. ZL4S still available. 17175 open to all States a day to VK4. RCV heard me, still unconfirmed that Clarrie VK5ZCV heard 8Y4VV in Trinidad. 471 ZLs again including ZL4PG (David). From the end of the first week in January conditions tapered off quite markedly, or the operators did, but openings did continue intermittently most days culminating in a good opening to VK6BV and others in Kalgoorlie on 28/1 and a very strong opening to VK1 and VK2 on 28/1.

Summing up my impressions of six metres this time, not as many good openings or contacts as VK3 as some time. VK2s very noticeable by their absence, commented upon in many circles. Activity in VK6 quite high with many excellent signals. Northern VK4 prominent, some Brisbane activity, but no doubt hampered by Ch. 6 most stations operating SSB now, many using

FT820 barefoot with about 10 watts output, others using same to drive fair sized insulators, therefore many very strong signals. Several good, strong well modulated AM stations noted, mostly matching it with the SSB boys. Weaker AM stations noted often working quite well further up the band. Good idea to get out of the GRM if crystal loaded — noticed they went up further of their own free will. Band operating manners very good, never heard a cross word between anyone, and most operators indicating they would move off the frequency on completing a contact so leaving the position to the original station, nice thought boys.

TWO METRES

As predicted last year two metres was again available this year for long distance sporadic. If contacts, and there were some, and that interesting ones. I think the letter from Kerry VK5BU would sum up most of the two metre operating, so here are some extracts for your interest. Again, these times specifically are Eastern Summer Time so you can better associate the time of day with the activity indicated.

22/11	1115	Adelaide repeater Ch. 4 worked.
23/11	0700	Ch. 4 again worked.
	0815	VK5BC heard 144 103.96 CW 53 AM
	1005	VK5LP S1 SSB 144.107 CW Also via Ch 4
7/12	0845	VK3ZAZ Ballarat worked via Adelaide Ch. 4 repeater
	0850	VK5CU/5 mobile Adelaide worked Ch. 50 and B.
15/12	0835	Heard briefly VK2YOK in QSO on Ch. B
	0850	Heard VK2ZAZ Gunnedah 144.1 SSB via Ea
16/12	1218	Worked VK5ZK, VK5ZTS 144.1 SSB
21/12	1220	Worked VK2ZAZ Gunnedah (1636 km) 144.1 x 5 x 3 SSB via Ea
	1225	Worked VK2ZCV at Tamworth 144.1 x 5 x 3 SSB
	1251	Worked VK2AT1 mobile Ballina (1974 km) on Ch. B, 5 x 4, 5 Ea
	1253	Worked VK2BYZ portable Evans Head near Ballina Ch. B, 5 x 9 Ea
	1254	Heard and called by VK4ZJB Brisbane Ch. B. No report obtained!
23/12	1029	Worked VK2ZRH Sydney 144.1 x 5 x 3 SSB
29/12	1200	Worked VK5MG Mt. Gambier
	1735	Worked VK5DK Mt. Gambier CW 5 x 4
30/12	0620	Worked via Ch. 4 Adelaide
	0626	Worked via Ch. 1 Mt. William (Vic) repeater
	0830	to 1100 Worked VK5MT VK5MC, VK5RO VK5LP, VK5SP6, 144.1 SSB
31/1	2033	Worked VK3ASV and VK3ZLV 300 miles east of Melbourne via Mt. William repeater, also VK3TN aeronautil mobile via Ch. 1

Now that's a pretty fair effort, and shows that the interest in 2m is alive to give to the game has allowed him in a very short while to make some very good contacts. I would like to add the following bits as well before summing up the two metre situation.

During the 2 metre opening on 21/12 Jim VK5ZMJ at Port Pirie, the mid-north of SA, worked 22 stations in VK2 and VK4 using SSB and Ch. 6 FM. That's a pretty fair effort too. On 16/12 TKY VK5ZDY and myself worked Daniel VK2ZAH, and was the only reported occasion (to me) of VK7 to VK5 this year. Around 1712 a report was received from Sydney that GRM was being experienced in this city to the International FMG system from a station in Hawaii just below the 144 MHz band! Now that's a long way — perhaps someone should have VFO'd down and told them to come up into our band for a contact! VK5VF Adelaide 2m beacon heard in Perth on 28/12 by VK6ZCM and VK6ZFV. Numerous reports of cross Eastern States openings. VK3 to VK4, VK3 to VK2, VK2 to VK4, much short skip around top end of VK4, Bundaberg to Rockhampton for example.

Taken all round, it was a great time for 2 metres, both SSB and FM. It shows how one mode can help the other. Hearing operators fairly constantly using FM on fixed channels gives interested operators the chance to monitor something, and it looks as though Ch. 6 (40) will remain a pretty popular frequency for a long while, despite Ch. 50 being nominated as a national calling frequency.

Looking back at the FM scene one could probably say more stations in Adelaide in particular would probably have worked into VK2 and VK4 on FM if they had better antenna systems — the idea of a small vertical antenna a few for cross town working but when the guns are out, you need something better. A 5 or 6 element beam done cost much to build, and the ideal would be one for both horizontal and vertical polarization — there are some operators around who only have horizontal, but certainly 5 elements at least vertical would be a great improvement. So what about it, you guys. Get on the job ready for next November and December when there should be sporadic E openings on 2 metres again.

Summing up 2 metres was really good this year helped by plenty of stations having equipment on one or other of the sections of the band, and in general having better equipment than that of a few years ago. More vigilant operators help to keep signals on the various frequencies and in turn more people hear them. It would be nice to see more stations migrating to the lower section of the 144 MHz band in tune with the sentiments I expressed last month about using the 2 metre band — we don't want commercial stations operating right up alongside even the FM channels — or do you? With so many operators now having SSB equipment on 6 metres it is not an enormous task to utilise the SSB portion of that gear for 2 metres, a 52 MHz exciter unit, coupled to a 144 MHz transverter with the use of a 92 kHz oscillator chain will start you on the way if you are not keen on starting the SSB at some lower frequency. There are plenty of QEO/512 values around for 15 watts or at 144 MHz the QEO/320 will give you 40 to 50 watts and a QEO/640 double that, and none of these will cost you a fortune to get going. It's essential more of you blokes give very serious thought to getting all the FM channels at times and spread your interest to other frequencies. I think you may find this the day that you do not do something about it. Channel 5A is con-igil!

PORTABLE OPERATION

Well, the big portable operation I started out on just after Christmas ended in disaster! The first day (20/12) was very pleasant and many 2 metre contacts were made, plus 6 metres of course. That night the wind changed, the first day brought with it a violent thunderstorm and dancing rain. I was out at 2:30 AM battling down everything, finishing up with 9 guy wires on the mast with the 6 and 2 metre antennas and rotor. Gradually the winds shifted to the west and increased in violence until they were screaming around the 144 foot peak of Myponga Hill in excess of 40 knots, threatening to tear everything apart. I spent most of the night standing up in the caravan in one corner holding it down against the wind which was raising the van 2 to 3 inches with each gust. The rain still poured down. My only comfort was the fact that the antenna was not blowing down (I hoped) so couldn't give me any cheerful lights.

Next morning the rain slowed down, but the winds continued to rise in strength, and anger I used the caravan down as best I could with baling wire and iron droppers. When the rain and wind stopped I unscrewed the rotor and said it was going to decide I might try my luck on the bands deep in the winds. All the equipment was safely housed in a Kombi van which weathered the storm well, and kept everything quite dry.

From time to time I had to sweep off the operating table a cascade of the fine sand being blown off the hill. The antenna, on 8, 10, 15 or 20 took an awful hammering and so did the very plastic rotor, but they all held together. By mid-afternoon I couldn't stand watching the caravan lift off the ground a few inches with the stronger gusts, so decided to pick it in — much to my disappointment.

Summoning some nearby help I was able to finally get the mast and antennas down in one piece. Now I still don't know. The rotor was encrusted with salt from the spray off the sea, and then I realised from where all the sand had blown down to me taking out a 10 msp shower of 5000 x 5000 grains from the nearest part of the coast, yet the winds were so strong and unrelenting that they never allowed the spray or sand to drop once it became airborne. What an ordeal! I'll go out portable again one day of course, but I don't think to Myponga Hill — too exposed to the

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elements, but what a pity, such a beautiful site for VHF if only to console myself to a degree, I did have eventually that some of the VK3 boys also packed up due to adverse conditions, so I didn't have quite such a 'ch'ckee after all.

MOONBOONCE

Congratulations to Chris VK5MC for his continuing success with 144 MHz Moonbounce. At 11:05Z on Saturday 30th November Chris contacted VE2FO and WK8PY on CW then a 2 way contact was successful with WK8PY on SSB, which looks like a first for SSB moonbounce. Chris sent a pair of MF121 FETs. The very sensitive 500 watt input for CW and 300 watt PEP output for SSB, to a stacked rhombic of 50 wavelengths per leg length Converter uses U310 FET for the front-end and situated at the antenna feedpoint. It was coupled to a pair of MF121 FETs. Trevor VK5NC was in the check at the time and was witness to the successful contacts.

The Dapto (NSW) boys have run into trouble with their moonbounce equipment with extensive damage caused by a nearby lightning strike. Diodes and transistors are to be replaced in the power supply, defective coil in the control system, faulty coaxial relay, transmitter multiplier board and receiving converter oscillator band translators etc. all need repairs. In addition the variable 575 transistor in the front end of the converter whilst not damaged shows a marked deterioration in noise figure, so it appears it will be several months before the equipment will be operational again.

From Roger VK2ZF comes news that Andrew VK6ZCN, starting on a 144 MHz moonbounce project and tests are scheduled to commence in March with 600 watt CW to a bay of 4 x 14 ft. (112 sq. m) total crossed Swan yagis spaced approx. 4 ft. with mesh reflector and will have the capability of reversing sense of polarization.

News from the hand that Barry VK3ZAY in northern NSW is starting out on moonbounces and is currently looking for a suitable receiver. No other details available at the moment, but Barry will let me know in due course of his experiences.

HEARD RECALLS

Results of Gem Ridge Complex meteor scatter show on 13th to 18th December 1974 between VK6ZT and VK6ZQD at Kaogorie on 18/12 a.m., VK6ZT-VK6ZBM Kaogorie and VK6ZT and VK6SU on 14/12 a.m., VK6ZT-VK6ZBM on 15/12 a.m. and p.m., and VK6ZT-VK6ZBM on 18/12 a.m. on 50.100 SSB. Ross Hull numbers were passed on each of the 5 m/s heard sessions with Kaogorie and Kerry VK6SU was heard on 14/12 in Perth off the back of VK6ZBM's beam. Others participating were VK6ZQZ and VK6ZJD. Levels VK6ZQZ were portable to Esperance and with vertical whip heard returns from Perth. Hour rates for 14/12 were 15/12 800; and 18/12 704. VK6ZT used 250 watts PEP into QO80B/4G with 5 m. beam at 50 feet, FT600 driver.

RECALL THE NEWS

Latest news from George VK3ASV indicates the world-wide standard 6 metre calling FM channel of 52.625 MHz is slowly growing in activity in Australia, especially northern VK4, replacing the old AM net frequency of 53.032 MHz. In addition to the FM net, Brisbane, heavy stations have moved away from 53.532 and QO operate on 53.995. This frequency has been suggested as suitable for use in VK3 to reduce Ch 9 TVI 52.625 FM was quite active during the last OX season in Melbourne, but has since gone rather dead. In VK4 the 52.625 channel is 52.556 and secondary 52.765 MHz. VK8VW re-broadcast their Sunday morning news on 52.556 also. The WA VHF Group Bulletin in November 1973 proposed a 6 metre band plan, viz. FM nets 52.500 to 52.600; 6 m nets 52.600 to 52.650 Experimental 53.300 to 54.000 MHz. VK6 also have used 52.586 as an AM net.

In NSW we find 52.556 used in some locations, but the primary FM net appears to be 53.950 in Sydney, especially WIGCE. The VK3 Division broadcast by VK2AWI is on 53.925 FM and 53.866 AM, and VK2BWM on 53.982 AM in the Wollongong area, this being an AM net in the Illawarra area. Other AM nets used in VK2 are 53.786, 53.826, 53.886 (Surrey Hills), 53.990 (South Coast), 53.997 (Wollongong). Also 53.328 MHz is used, which is an FM net George adds - "What a mix-up!"

SA, including Alice Springs, use 52.525 FM, the

main AM net being 53.100 MHz. Neither of these two frequencies are used by VK5WV, instead broadcasts are made on 52.156 using tuneable equipment and SSB.

Victoria, South Australia and Tasmania still use 53.932 AM net, but it seems appears to be dying out. VK7WV and VK3WV up to recently used 53.032 AM for their broadcasts.

At the VK3 VHF Group meeting last March, John VK3ZMA advised two new 8 metre AM nets had been started in the Melbourne area, namely 52.900 and 53.100 MHz. In conclusion George added he would like to see AM nets fade away, unless only for beginners up to 54 MHz away from TV, and more use made of low power 5 metre FM nets.

Thanks George for the information, which came via VK2ZTB. The most important point to come from your survey is the need for some semblance of order to be arranged for 6 metre net operation, whether AM or FM.

That will have to do for this time, there is quite a lot more which could be written, but due to the time lag at the moment, much of the news is too old for inclusion. Closing with the thought for the month: "The very sensitive people find fault you'd thing there was a reward".

The Voice in the Hills

STOP PRESS 432 MHz RECORD BROKEN

On Sunday, 22nd February 1975, a two way contact on 432 MHz was made, this was completed by Wally VK6WG in Albany and Les VK3ZBJ in Melbourne. Signals were not strong. Wally used CW and Les SSB. Distance about 2440 km. That now narrows down the field for anyone wishing to extend the distance further; eastern Victoria or Tasmania remain about the last chances unless someone makes it to New Zealand. Good work boys, let us hope it acts as an incentive to others to get on 432 MHz.

432 MHz OPENING

For days the 2 metre enthusiasts in VK3, VK5 and VK6 have been watching the build-up of conditions suitable for long distance 2 metre operation. Finally with a series of measures extending right across southern Australia conditions came right. First news came on 31/1 with Wally VK6WG at Albany working into VK5, also Wally VK6XY at Channel 8 FM, and later VK6ZQD. Saturday conditions continued good right through to mid-day, then Sunday evening produced its share of signals together with the 432 MHz record. Bob VK6BE who describes some repeated long-hauling up 40 metre schedules almost daily with VK6ZSK and VK6SLP, worked 10 VK5 and 16 VK3 stations on 144.100 SSB for a total of 87 contacts which is a pretty good effort. Bob commented that signals went up to 5 x 8, a contact being with VK3BMD who was operating mobile in Melbourne running 20 watts PEP to a five-eighth wavelength whip! That's hauling them in! Bob also added that VK3 had been working into the Albany Ch. 2 repeater, Sunday evening contacts to Bob from VK5 were not over strong, but Gary VK6ZK and Peter VK6ZPT were able to work him. I had to listen to the others as Bob was too weak here. Gary commented that it was interesting that it was possible to work Bob on 2 metres but not on 20 or 40 metres. So much for VHF.

So that's the reward of the diversified operators. Those confined to repeater operation cannot possibly know what it is like 5 or 8 years on VHF. I still get a thrill from working someone long distance away, with my own equipment, not that provided by someone else on a hill. And how very interesting it is to see the same VHF pattern emerge, finally to note conditions are right. This time the ducting or inversion was centred some distance below the continent, restricting operation to those areas immediately bordering the coastline, particularly Mt. Gambier and Victoria.

LATEST ON MOONBOUNCE

On 30/12 Chris VK5MC worked WK8PY on CW, received 448, sent 448. Heard K4IXC, then WK8PY called on SSB, Chris received 447.4, sent 447.5. Chris used 300 watt consecutive periods of 2 minutes. Both Ron VK3AKK and Trevor VK5NC present on

those occasions

On 21/1 heard 3 stations, but not well. Antenna not always in right spot for moon bounce.

Trevor VK5NC and Mt. Gambier with his 56 elements on 2 metres has heard the VK5MC echoes, also uncontrolled CW Ron VK3AKK has improved his moonbounce for a 432 MHz net, hearing good echoes 3 dB above noise consistently.

Contests

with Peter Brown VK4PJ

Farall Contest Manager, GPO Box 638, Brisbane Qld 4001

CONTEST CALENDAR

MARCH	1 & 2	ARRL DX Phone
	6 & 9	BERU CW
	8 & 9	YL-OW CW
	15 & 16	ARRL DX CW
	22 - 24	BARTS Spring RTTY
	29 & 30	QO WW WPX SSB
APRIL	5 & 6	Polish (SP)
	12 & 13	Sveas (HSZ)
	26 & 27	WAECQ RTTY

CONTEST DETAILS

A small number of overseas radio associations send full details of the rules of their forthcoming contests to the WIA and these usually arrive several months in advance of the contest date. It is not practicable to publish these rules and scoring tables in full as most would require a page of our journal. Most other information about DX contests is supplied by Frank WIWY, and this arrives by airmail about the middle of the month. Unfortunately the detailed entry gateway refers to contests which are to be held during the next calendar month. As copy for our magazine for that month must be with the Editor by the third of the preceding month it is frequently not possible to include as much contest information as some readers would like. However, you send a BAKS to me at Box 47, East Melbourne, 3002, the detail required will be forwarded to you.

1974 WPX SSB RESULTS

Frank, WIWY sent these out by airmail together with the following comment, "Hot a bad showing for VK, but you see fellows could do better".

OCEANIA - Australia

VK1AOP	A	111,008	SSB	188
VK2OW	A	8,358	71	42
VK4VU	A	274,247	842	139
VK4FH	"	162,652	358	116
VK4AR	"	21,375	110	70
VK5HO	A	361,770	838	148
VK5MF	"	74,680	285	62
VK2XT	"	31,877	323	93
VK3SM	21	23,778	160	43
VK3W	"	174	1	1
VK2APK	14	229,524	479	171
VK3LK	14	99,575	291	129

ROSS HULL MEMORIAL CONTEST

Only two logs to hand up to this date, 28th January. A VK3 has 48 QSOs on 2 metres and 43 on 10 metres. A VK4 with some 18 Brisbane has 225 QSOs on 8 metre. There were some letters to hand and a few of them comment on the very limited opportunities amateurs in the Brisbane, Wagga and Melbourne areas have to use 6 metres.

Another refers to similar restrictions in an area where TV Channel 54 limits 2 metre operation. It is also suggested that the contest runs for too long a period; that there are better times in the year for VHF working, and that to score accurately one needs to be a mathematician with a very good aptitude as supplemented by detailed road maps. The scope of the contest is too wide, the high qualifications and the equipment, there is the time necessary to calculate the distance of each QSO. Fortunately most writers, while being critical, also include constructive suggestions. However, all have stated that they enjoyed the Contest.

Well, I would not attempt to draft new rules for this Contest as it seems that special sections must be carefully defined. With that in mind I have requested that a committee be set up to "overhaul" the contest rules and scoring table. Recommendations can then be made and you, the contestants, should have the opportunity to comment before final decisions are made.

BERU 1976

A reminder that this contest will run from 1200Z Saturday, 8th March to 1200Z Sunday 9th March. Prizes as notified in AR for February. Trophy medallions to VK winner and middle placing.

RESULTS BERU 1974

VK2BPN	1775	VK3RS	489
VK3ZC	515	VK6BJ	275
VK3ZJL	530	VK3CX	215
VK8RU	665		

The Receiving Contest was won by Eric Treblehook BG9 195 who receives the Receiving Book. VK silver medallion VK3BPM, Bronze VK8RU.

Awards Column

with BRIAN AUSTIN VK5CA
P.O. Box 7A, Crailes, SA, 5152

THE AWARD

The award is available to licensed amateurs. Contacts on and after 1st January 1958 are valid.

The applicant's own QSL cards for the Ghanaian stations with whom contact is being claimed must be included with the application.

The award is available for all CW, all phone or mixed modes.

The fee for the award is 7 IRCs.

The address for application is:

QSL Awards Manager

Post box 3778

Accra, Ghana.

Requirements: Confirmed contacts are required with 5 different BG1 stations using at least two bands

THE AWARD

The award is available to licensed amateur and shortwave listeners (on a "heard" basis).

Contacts with 5N stations are valid.

Do not send QSL cards. A list, showing full details of the contacts should be certified by the Awards Manager of a National Society.

The award is issued for all CW, all phone and mixed modes.

The fee for the award is 5 IRCs.

The address for applications is:

Nigerian Amateur Radio Society,

Post Box 2373

Lagos, Nigeria.

Requirements: Confirmed contact with 5 different 5N stations are required.

P.A.C.C.

The award is available to licensed amateurs.

Contacts on and after 1st June 1945 are valid.

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Letters to the Editor

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers

The Editor,
Dear Sir,

I would appreciate it if you would make the following matter as widely known as possible.

Until January of this year, I had the call sign VK2HT and had been a member of the WIA for 15 years. In May 1973, I had a severe heart attack, and was in the hospital four times in the year.

I realised I would have to retire from my profession, and gave up all my gear to various clubs. I surrendered my licence and resigned from the WIA reluctantly. I went to live in a small unit where aerial systems were impossible. My problem is that for a few past years there is a very active pirate who uses my call sign VK2HT, and for several years I have been getting a flood of DX cards for contacts he has made in my name. He has the nerve to use my name and address (former) and I have been greatly embarrassed by his activity. I would like it known that VK2HT is now no longer a legitimate call sign. I would appreciate it if anyone can catch this pirate and let me know, and I shall take legal action against him. He is still very active. Recently, I had an official letter from Germany asking for details of a QSO a month or two ago, as they were suspicious about the call. I have not made a call on the air for nearly two years.

If anyone can supply me with information I would be very glad to take steps. The pirate is very familiar with my, or what was my setup, and is very active. Is there any way that he can be netted and stopped, as he is still active and cards especially from Japan are coming in?

Thanking you for all the years of good fellowship and wishing you well with many new recruits in the coming year.

75.

(Rev.) Harry Harris
5/25 Ettonville Parade,
Croydon, NSW, 2132

The Editor,
Amateur Radio
Dear Sir,

Townsville Pacific Festival Results for Contest.

Re the above-mentioned contest results, it would be appreciated if a correction could be published.

In the published results I omitted to include the score of VK1VP.

Scores for VK1VP were 150 points in section 'A' and was the highest score for VK1.

R. R. Kearney, VK4HE
Queensland Contest Manager

The Editor,
Amateur Radio
Dear Sir,

In reply to the letter in AR January 1975 about the increase in licence fee, a number of points need to be discussed:—

1. Mr. Morris implies that amateurs are paying considerably less than the "poor" commercial operator. Unfortunately as an amateur I cannot use my radio for the purpose of gaining income nor can I claim the licence and equipment costs as a tax deduction thus effectively having the cost of these items. My radio actually COSTS me \$12 whereas the majority of commercials would be savings costs or actually making money from their operations.

2. If Mr. Watkins had been a complainer he would have, like me, received a letter from the PMG which clearly illustrated how little our political masters realise what amateur radio is and what contribution it makes to the community. The important crisis when it comes will most surely be settled against us in the present climate of opinion. We must be sufficiently politically aware to realise that without continual representation of our interests to parliamentarians and bureaucrats we will most certainly be ignored as insignificant and ineffectual. However, if we choose to represent our case every time against us, and the fee increase is an ideal opportunity,

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then we will avoid losing the majority of the 144 MHz and 432 MHz bands to the commercials, so beloved by Mr. Morris. These same commercials realize something amateurs do not, they are prepared to employ considerable monies on direct and indirect lobbying . . . even to the extent of fostering a feeling of helplessness in the ranks of amateur perphaps

Amateurs must stop being ostriches. Politicians hold the power of life or death over our hobby and we will just go away if we are "good boys" and keep quiet when we are disabused. There are plenty of others waiting in the wings to knock the amateur and take over our frequencies for the purposes of commercial profit.

Yours faithfully,

R. Martin Luther VK4VU

Editor,
Amateur Radio
Dear Sir,

In reference to Eric Jamieson's VHF/UHF column of December AR I wish to take issue with several of his inferences.

I cannot believe it is the opinion of the bulk of SSB (tunable stations in the 8 metre band that AM stations, tuneable or crystal locked, should be excluded from the first 300 kHz of the band. The fact that AM requires a bit more spectrum than SSB should not preclude AM operation anywhere in a band 2 MHz wide. If Eric is worried about bandwidth why advocate impressing 25 watts of audio on 36 watts of carrier with the resultant splatter. Some SSB signals I have heard on 8 metres occupied a dem side more bandwidth than a well modulated AM rig. Perhaps some operators without the ability or interest to homebrew a rig, even lack the ability to operate commercial equipment. To infer that the first 300 kHz of the 8 metre band is the preserve of SSB tuneable operations smacks of self indulgence that is hardly compatible with the ethos of amateur operations in the VHF/UHF spectrum as I understand them — those of tolerance and encouragement.

A well known fact is that a certain percentage of amateurs are well heeled and can afford commercial SSB equipment. Eric may well be one within this group but I sincerely hope his indulgent sentiments for that group are not representative of that group. A great percentage of the amateur fraternity is comprised of the lower income group whose capacity for investment in equipment is limited to homebrew ex-commercial or disposals type equipment very little of which is SSB. I find intolerable the inference that this group should not pursue their hobby with the equipment available to them in the spectrum not specifically designated for other services.

As DX is, generally, first worked within the first 300 kHz of 8 metres, as the MUF slowly arises, to suggest that only SSB stations should be first (as they invariably are anyhow) to work it would be to deny a section of our fraternity the very experience to which they aspire. Telling Eric that AM stations who perennially utilise the 8 metre band help justify our frequency allocation. Many SSB stations only work the frequency during the DX "season".

I consider we should actively encourage all modes of operation anywhere in the tuneable spectrum of 8 metres and can do without the parochial attitudes that frequently prevail.

F. Pendlebury, VK3ZAA

The Editor,
Amateur Radio
Dear Sir,

My thanks to you for giving me an opportunity of replying to the above letter. My first reaction after rushing to look at what I had actually written and realizing a slip of the pen, was to ignore the letter if only because of inaccuracies and misinterpretations, but after a couple of days decided the best interests of "VHF — An expanding world" would be served by a reply.

I would suggest readers at this stage get out December 1974 "Amateur Radio" and look at what I did write on page 18, the VHF page, under the sub-heading "The DX is coming". Having done this, now read the letter from VK3ZAA again.

Now anybody can possibly dream up the implication that I advocate AM stations should operate above 52.3 MHz is beyond me. There is no mention

of AM, not even by implication, at all until halfway down the paragraph when I say "if you are running AM, please see your signal is well modulated"

suggested operating above 52.3 MHz for crystal locked transmissions simply because a station up there should be in the clear "when the band is wide open" and being in that region such a station would be less likely to finish on top of someone else, and better able to be worked by others. Good grief! What should I say? The suggestion I made for those type of conditions is perfectly sound — if VK3ZAA wants to operate 10 kHz inside the band or elsewhere, crystal locked AM or SSB that's ok by me — but any inability to move up or down a few kHz to get into the clear under current conditions will certainly preclude many contacts.

Mr Pendlebury comments at the start of his second paragraph that he doesn't believe it to be the opinion of the bulk of SSB operators that AM stations should be excluded from the first 300 kHz of the band. Of course it wasn't. Who said it was? I did not. How anyone can read that out of what I wrote is beyond me. How do you reply to such a question? He can read that out of my writings, what hope have I of convincing him of anything.

I note Mr. Pendlebury received his call sign in late 1972. Perhaps he is young, and rather inexperienced. If so, time will help this situation. If he is of mature years then he would be well advised to study more carefully written words before rushing into print. When he has experienced one of those days "with the band wide open" as they were some years ago, but not so much of recent time, he will surely better understand the reasoning behind my suggestion.

solar flux and sunspots

Arrangements have been made by Frank VK3QL with the Ionospheric Prediction Service, for the daily flux number for the preceding week to be included in the weekly broadcast over VK2W1.

A word of warning though is necessary. This Solar Flux number is not related to the actual sun spot number, but for the world DX'er, this number can be used as a guide to propagation conditions that have taken place, and one can form an opinion of what may be expected in the future.

For those who have the means of listening to WWW, this flux number is given every day at 18 minutes past the hour.

An indication of how this flux number could be used was the weekend of the CW section of the VK2ZL contest when excellent conditions prevailed until the Magnetic disturbance number 12002 on the Sunday. The flux number in this instance reached 14.4, and then plummeted to round the 70 mark.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1954	8.4	5.6	4.2	3.4	3.7	4.2	5.4	7.2	7.5	7.9	8.4	12.0
1955	14.2	10.4	10.4	23.4	28.8	36.1	40.1	48.5	56.5	64.4	73	81.9
1956	68.5	98.4	108.3	118.8	127.4	136.3	145.5	149.5	151.4	154.0	159.9	163.9
1957	170.3	172.2	174.3	181.0	185.5	187.8	191.4	194.4	197.2	199.5	200.8	200.0
1958	198.0	201.0	201.2	206.8	191.4	188.8	184.7	184.9	183.8	182.2	180.0	180.5
1959	178.6	178.5	175.3	180.4	184.4	197.4	184.7	185.2	184.2	141.0	137.2	132.8
1960	128.9	128.9	129.5	134.8	117.0	114.0	106.5	102.2	97.7	82.2	67.2	68.7
1961	85.2	74.8	68.8	64.3	60.0	58.5	58.0	52.4	52.3	51.8	50.9	57.7
1962	48.2	41.8	38.8	38.4	38.3	38.3	38.8	35.0	32.7	30.8	30.0	29.5
1963	28.4	25.8	28.8	28.0	28.8	28.2	27.7	27.2	26.9	26.0	23.8	21.3
1964	15.5	17.8	15.4	12.7	10.8	10.2	10.2	10.4	10.4	10.0	9.7	10.3
1965	12.0	12.3	12.7	13.6	14.7	15.5	15.4	16.5	17.2	19.4	21.9	23.9
1966	37.0	30.6	33.8	36.4	38.5	45.3	48.8	54.8	62.7	66.8	69.0	71.2
1967	73.1	78.4	79.4	81.5	84.2	87.9	83.8	84.8	84.4	84.0	86.2	100.0
1968	102.2	102.7	104.8	107.4	107.8	107.7	106.2	104.8	107.1	106.6	110.0	109.4
1969	108.5	107.5	105.3	103.0	103.2	102.8	100.1	100.8	105.8	104.5	105.5	106.6
1970	103.2	108.7	108.8	108.6	108.1	105.1	103.3	98.8	95.4	81.8	87.2	81.8
1971	75.8	75.2	71.6	68.0	60.0	63.9	65.5	65.0	68.4	87.1	87.8	69.9
1972	76.8	71.2	72.4	73.4	72.9	70.4	68.1	65.4	62.0	60.4	58.5	54.8
1973	50.4	48.8	45.8	42.2	40.4	38.6	37.8	36.4	34.8	33.2	32.6	32.6
1974	34.2	38.2	35.8	35.7								

To accuse me of parochial attitudes and other various inferences is quite laughable. I guess there are many who have read my notes in various publications over the years who would back me completely when I state I have always believed I have adopted a most tolerant and understanding attitude towards all on the various bands — i.e. steering a middle course, and with as little bias as possible. I cannot remember when the Editor last bile-penned any of my notes!

Yes, Mr. Pendlebury, I do have a few items of commercial equipment, but I have a lot of homebrew too, I guess there would not be a lot of amateurs around in VK who over the years have constructed more equipment than I, ranging from AM, DSB, SSB and FM for both HF and VHF. VHF converters, 6 and 2 metre transverters, 432 MHz transverters, power amps, linear amps, portable and mobile equipment SWR meters, noise bridges, antenna tuners, antennas, test equipment, power supplies, and so I could go on. Perhaps you will grant me the privilege to own a few pieces of commercial equipment now. My operational interests are evenly diversified when you know that I operate 160 to 10 metres SSB, 8 and 2 metres AM, SSB, FM and CW, 432 MHz AM, SSB and CW, and before long on 575 MHz too. Apparently in your words this makes me self-indulgent, lacking in tolerance and encouragement. At least I do my share to keep the bands occupied by operating in all segments and using all modes. Are you playing your part to keep the bands alive?

I conclude with a relevant thought from the writings of Bertrand Russell . . . "The degree of one's emotion varies inversely with one's knowledge of the facts — the less you know the hotter you get".

73, Eric Jamieson, VK5PL

Frank Hine VK2QL

30 Abbotsford Road, Homebush, 2140

The flux number could have been used as a guide for the CW section of the WW contest when again the flux number rose, with a quiet sun, to almost 100 after slowly climbing from the mid 60s. During this contest the 28 MHz band was wide open to all parts of the world.

At present, the two theories being advanced on the current cycle, one is that it will follow approximately the normal 11 year cycle, and on going back to the sunspot number records Frank has since 1954, it could be about the middle of next year. However, mathematicians have produced a strong case to indicate that the bottom 1 year will not be reached until the year 1977.

The L.P.S. have advised VK2QL that one sun spot of the new cycle has been sighted for a short period of a few hours only. When nearing the bottom of a cycle, it is possible to tell whether a sunspot belongs to the old or the new cycle, but it is too involved to cover in this report.

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Commercial Kinks

with Ron Fisher VK3OM

3 Fairview Ave., Gap Waverley 3150

This month it's back to our old friend the FT200
for a few quick and easy hints.

First it's over to Lionel Swan VK2CS.
"Ever since I have had my FT200, the associated
FP200 power supply has had a terrifying metallic
"clunk" every time it was switched on, for
apparently the momentary short circuit in the
form of the discharged filter capacitors. In fact
during that time, I have blown the 5 amp fuse
in the power transformer primary twice due ap-
parently to no other reason than that the switch
closed at the instant of maximum current.

During the week I had a rash of brains and
installed a CZII thermistor in the transformer
primary circuit — and the saints be praised, there
is now only a barely perceptible grunt when the
power is switched on. There are many types of
thermistors available, but the CZII seems to be
optimum for most transceivers although the higher
power types may need a CZ12."

Lionel's idea is certainly worth the time it would
take. Many amateurs have had trouble with diodes
blowing in the FP200. The thermistor would no
doubt ease the strain on them too.

Receiver cross modulation is a problem that
seems to effect some amateurs more than others.
Over the years I have had no serious trouble
with the FT200 in this regard but if you happen
to live in an area where broadcast signals are
strong on 40 metres, here are a few simple
modifications.

The harmonic producing diode (D301) in the
output of the crystal calibrator circuit is the
number one suspect as it is connected to the re-
ceiver input at all times.

Fortunately, there is a spare set of switching
contacts on the mixer/operate/calibrate control,
and this can be utilised in two different ways.

The first and easiest way is to route the output
line of the calibrator through the switch. It is
necessary to use a small diameter coaxial cable
for this and in order that the capacity of the
cable does not appear across the input of receiver,
insert a 10 pF ceramic capacitor at the junction
of the cable and the receiver input. The second
method is a little more sophisticated. It involves
applying a bias to the diode to effectively cut it
out of circuit. Four new components are needed
plus a small amount of re-wiring. Needed are two
47K ohm resistors and two 4700 pF ceramic
capacitors. First locate the 9 volt connection on
the Rec/Op/Cal and bridge to the spare section
so that it connects to the moving arm in the
operate position.

From the junction of C308 and C301 connect a
47K resistor to ground. Connect one of the .0047
mF between C301 and C301. Now connect a 47K
resistor from the junction of the 4700 pF capacitor
and the diode to the moving arm of the Rec/Op/
Cal switch and bypass the switch and of the 47K
resistor to ground with another 4700 pF capacitor.
This completes the modification.

Many of the older SSB transceivers lacked a
means of varying the drive under tune-up conditions.
Next month we will discuss means of incorporating
a drive control in Swan and similar rigs.

PROJECT AUSTRALIS

with David Hol VK3ZCH

FUTURE

In the middle of March the author will be attending
an AMSAT meeting in Washington which will ex-
plore the roles of the National groups in future
satellites. Up for consideration by the meeting
will be a new Project Australis command system
together with an integrated RTTY Telemetry/
Codestore system. It presents plans with those
sub-systems will be part of a future Joint Australia/
AMSAT CANADA satellite project designed to pro-
vide a continuation of the low orbit (e.g. Oscar
6 and 7) programme into the late 1970s. Members
are invited to write to Project Australis with sug-
gestions for future satellite projects. Any mail
should reach me before my departure on March
13th.

PAST

Some difficulties were experienced in late January and early February with Oscar 6 commands affecting Oscar 7. At this time the satellites were virtually in the same spot in the sky and despite precautions some of the dozens of commands a day fired at Oscar 6 caused unscheduled mode changing in Oscar 7. We apologise for any inconvenience but these problems were really out of our control.

OSCAR 7 REF ORBITS

DATE	Long	Lat	Day	Orbit Time	W
1	10849	725.24	68	7	1320 108 23 58
2	10861	721.18	63	7	2 1332 7 56 51
3	10874	720.10	67	4	3 1345 101 85 85.2
4	10886	20.40	52	4	4 1357 1 18 50.0
5	10899	114.96	66.2	5	5 1370 45 77 63.6
6	10911	14.08	51.1	6	6 1383 145 75 77.1
7	10924	108.82	64.9	7	7 1395 49 09 62.0
8	10938	8.75	48.8	8	8 1408 143 37 75.5
9	10949	104.68	53.6	9	9 1420 42 71 80.4
10	10961	4.81	46.6	10	10 1433 136 90 73.8
11	10974	59.54	62.3	11	11 1445 38 32 56.9
12	10987	184.4	79.0	12	12 1458 130.61 72.3
13	10999	54.40	61.0	13	1470 29 94 57.2
14	11012	148.33	74.7	14	1483 124 23 70.7
15	11024	49.26	69.7	15	1495 23 66 55.8
16	11037	144.19	73.4	16	1508 117 85 89.1
17	11049	44.12	58.0	17	1520 17 12 54.0
18	11062	136.08	72.2	18	1533 111 47 72.3
19	11074	39.99	67.1	19	1546 10 80 46.2
20	11087	135.01	79.0	20	1558 105 08 65.9
21	11099	33.84	65.9	21	1570 4 42 60.0
22	11112	128.77	69.8	22	1583 58 70 84.3
23	11124	28.70	64.6	23	1596 162 99 77.9
24	11137	123.63	68.4	24	1609 53 32 62.7
25	11149	23.58	53.9	25	1621 146.61 76.3
26	11162	118.49	67.0	26	1633 45 54 61.1
27	11174	18.42	52.0	27	1646 140.23 74.7
28	11187	133.35	66.7	28	1658 36 56 59.9
29	11199	11.28	50.7	29	1671 133.84 73.1
30	11212	108.21	64.4	30	1683 33 15 57.9
31	11224	8.14	49.4	31	1696 127 46 71.5

4. A spurious signal (AS) on 14291.7 kHz took a long time to track down. We eventually found it to be in Thailand. By Amateur methods we ran it down to a broadcast station of the local television company at the airport at Bangkok. The company didn't want to replace the old transmitter because they hoped it would stand up for a little longer, but by intervention through their engineers it was replaced and the spurious cured.

There are many more I could recount, but space does not permit. You will remember in a previous issue about KJG in Yugoslavia, and TCK in Turkey it is by co-operation between Observers, and between Amateur Societies that the best work has been done, in other words BY AMATEUR METHODS.

Reference the Majak (Russian) jammer on 7030-7040 kHz jamming the Russian broadcast on 7035 kHz the signal strength from that jammer has been measured in Los Angeles and is 2000 microvolts (that's two millivolts) that is an awful lot of signal, and no wonder it is so troublesome here in Australia.

20 Years Ago

with Ron Fisher VK3OM

MARCH 1966
Our Working Heritage. The Editor for March 1965 looked at our use or perhaps our non-use of the amateur bands. One paragraph was significant "To protect what's left it has been said that we cannot now expect to rely on the two larger world societies to represent Australia at the next International Conference — when ever that might be. We must have our own representative there". And indeed we did.

Only one main technical article appeared, however it was a case of quality rather than quantity. Eric Cornelius VK6EC, remembered of course for his superb series on television a short time earlier, wrote on "Wobblers" — Sweep Generators.
The late Don Knock VK2NO supplied a few interesting "Hints and Kinks". Six metre men were having fun. The VHF column, "Fifty Megacycles and Above" reported DX contacts between VR2CG in Fiji and VK6HJ in Perth. FKASB listening only, heard VK2, 4, 6, 8, 12 and VK2, while VK12M on Macquarie Island heard many New Zealand stations.

The Short Wave Listener Section reported on stations heard, activities of members plus a few technical ideas including the perennial 'S' meter circuit.

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- Eight line free to all W.I.A. members.
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A.R. Type Frequency Counter with prescaler to 200 MHz, \$120.00. O.N.D. B. Bathol VK3UV, 3 Cornwells Ave., Aspendale, 3195. Ph. (03) 80 6424 (evenings).

FT100 excellent condition (no 160m), \$430 or best offer. Philips IC-22 mobile transceiver, 4 months old, complete with 14/50 and accessories, \$175. Russell Kelly, VK3NT Ph. (03) 81 7243

AWA McKean Car Phones, FM. One on ch. 40 one on 52.25 Both in clean condition and work well. Easily changed to multi-channel operation, \$50.00 each, or \$95.00 for the two VK4UX, QTH.

Swan 354 T/Y.R. AC PSU, spare PA tubes. BC221 Frez. Meter with handbook and circuit for solid state. Philips CRO 2 track CRY Variety PWR transformers, valves, etc. Best offers. VK3AJR, QTH.

TV Equipment, AWA TV off air receiver, \$40.00. Video monitors, various sizes, \$40.00. Studio Sync generator RCA TB2, \$45.00. Monoscope TV picture

generator with sync. generator, spare tubes, \$50.00. EMU 302 Wave Form Monitor, \$40.00. RCA Video Switcher 3 x 9 inputs, \$50.00. Various other TV equipment. All items ONO D. Stokes, VK2ZPM, QTH. Ph. (02) 476 2304.

2 Philips Battery Eliminators with valves, very early AWA radio 9 valve Kriesler radio P 2A3s are gassy. Also Type "S" power supply, in good order. J. E. Mackie, VK2ZDM, Hillston.

Geslow Transmitter and PBU G4/229 with matching speaker, mika, manual, 60-10 Ma. 55B — 260 W. PEP. PW 225 W. AM 120 W. As new condition. \$300.00. Miss E. Woolsey, 158 Kilgour St. Geelong. Ph. (052) 21 2674

Completed Wellington VHF Group handheld 2m FM Transceiver KIR with xials for channels A R1 and 40 plus 7W amplifier stage and pre-amp, 755. Mostley 4 band trap vertical 10-40 M, 550. Type 3 Mk 2 portable transceiver AM CW, 14-18 Ma. \$50. VKCANG, QTH. Ph. (03) 28 2024.

Yaesu FT19B1 Brand new, \$545. VK3YBA, 67 Victor Rd., 5th Oklaigh, 3187

Yaesu FT7E Transceiver, DOTS power supply, FV5D C VFO, Hygan 18W portable antenna 80m-10m. And 30 ft. URB7 coax — all in new condition and complete, \$300.00. R. F. Lloyd, VK3KQ, QTH. Ph. (03) 852 8377 bus., (03) 48 2200 A.H.

8m FM Model 86 set and handbook, \$55. Also Sale meters, offer, VK3ZKS, QTH. Ph. (03) 83 6793.

Collins R381/URR Receiver, 5.32 MHz, good cond including manual. See articles AR, \$500. J. G. MacIntyre, 27 Jean Rd., Epsom, Springfield, Qld., (072) 80 4020 A.H.

Yaesu-F2000 Transmitter, in excellent working order L30 to 10m. Complete with matching microphones and 10 new spare valves. \$180.00. VK5HE, QTH.

Solid State Television Videocam Camera, complete with fast scan to slow scan sampling converter for SSTV operation. Home brew but very neat construction and small in size. VUdon nearly new and complete with lens, \$100.00. VK5GV, QTH. Ph. (08) 352 5155

Telex 25 18, single section Hilla, 10 in triangle, \$15 Hilla 10 el 2m Yagi 87 CDR rotor TR-44 with Indicator and 240/110V transformer, \$40. VK2ACQ, QTH. Ph. (04) 448 3558.

104 Copies GB7, 1965-1973, some complete years, good condition. Any reasonable offer accepted. Also R39B "Redi-communication" 1965-1972, 101 copies some complete years good condition, price as above. VK4MY, QTH.

Edgemoor 588A Receiver, ham bands, 1.8-30 MHz, 100 kHz calibrator with data sheet, price \$180.00. VK4MY, QTH.

FT DX 569, immaculate condition, little used, professionally modified to better than FT DX 401.5 spec incl. 100 metres fan, CW filter, noise blanker, noise limiter, full metering of HF, screen current and volts, 5W, 6W, 10W, external 500 WQ as needed, 115 Matching external speaker, 325. Magnum 515 RF speech processor suitable FT DX 401, 401, 560, as new, little use, \$135. The lot \$740. VK3ARZ, 12 Explorers Court, Vermont South, 3133. Ph. (03) 232 4962.

AR7 all coil boxes, 380. Many aerial, tuning caps, OAK switches and ex aircraft gear. Phone 868-9554. VK2ZKV, 41 Torres St. Kurnal, 2231.

WANTED

88B HF Bands Transceiver, suitable for AC and DC operation. W. Marshall sea, VK2ADZ, 28 Probert Ave., Griffith, N.S.W. 2680. Ph. (069) 62 3718 A.H.

Kindly Amateur to Coach keen but busy prospect at his QTH or yours to pass AOCG in August 1975. Agree to pay coaching fee for good no nonsense knowledge approach. Offer to Stephen Phillips, 7 Macdonald Court, Nymwaying Ph. (05) 878 6350 — S. G. Phillips.

Service Manuals for Pys Transmitter FM Ranger model PTCA 8902 T.W.L. and Vintec Vantage MTR 19 B J Cleaveland, Bombala, N.S.W. 2533

Circuit Diagram for No 19 wireless set wanted urgently John Sparrows, 155 Daglish St, Wembley WA, 6016. Ph. (092) 81 6000.

Heavy duty commercial 12 volts DC Mobile Power Supply Unit to suit Swan 350, 800 vdt at 500 ma etc. etc. Price and specs to VK4V0, 4 Topaz St, Mount Isa, Q. 4825. Ph. (077) 43 2905.

Intruder Watch

with Alf Chandler VK3LC

1536 High Street, Glen Iris 3146

A few of the successes that the Intruder Watch has achieved may be of interest to Members, but firstly a plea may be more appropriate. I have a rather comprehensive report on the Broadcasters in the 3.5 MHz band emanating from Indonesia, but need more information. On comparing notes with the U.S. I find that the frequencies given are compatible with frequencies on which Observers in the U.S. can hear AD carriers, but cannot get enough strength for identification. I quote from a communication from K8KA — "We need help, particularly from Reg 3 because it involves tropical weather reports where we can NOT, repeat NOT, get anything at all here during the winter months."

I have been hearing only a very few signals on 14 MHz so that we are down to practically nothing, but if we knew from southern hemisphere reports that a certain signal is coming through we could, get anything at all and just as soon as we find it we can alert it to FCC and get some action. This has proved extremely useful!

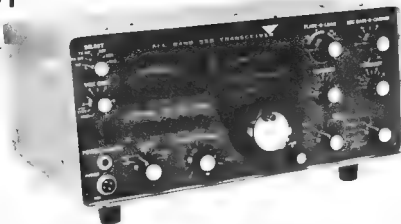
Now for some successes —

1. A harmonic on 14240 from the BBC relay in Johore, Malaysia, was causing a lot of interference. The RSGB became interested and got the engineers to suppress the 2nd harmonic down to —790B and we haven't heard it since.

2. We complained about a harmonic from a station on Okinawa on 14330 MHz and they fixed that.

3. On 14115 the Voice of America station in the Philippines was heard and reported by one of my Observers. I subsequently reported it to the U.S. and the engineers cured the spurious. An interesting phenomenon occurred here, it was found that two closely located transmitters were interfering with each other, the harmonic of one and the fundamental of another transmitter were mixing to propagate a signal on 14115 kHz.

Economical Mobile/Base Station FT-201



FEATURES

- Built-in AC power supply (DC optional)
- 260 Watts peak SSB 180 Watts CW & 80 Watts AM
- Factory sealed, solid state VFO with 1 KHz readout
- Effective Noise Blanker, threshold adjustable, for elimination of noise spikes
- Built-in front panel adjustable VOX
- Automatic break-in CW operation with sidetone
- ± 5 KHz receiver clarifier
- Built-in WWV/JJY reception

- Adjustable carrier level for tune-up and Novice operation
- Indicator lights for internal VFO and clarifier operation
- All mode operation - SSB, CW, & AM
- Fast or slow receiver AGC
- Built-in internal crystal control provision and dual VFO adaptor
- Built-in final cooling fan
- Complete line of compatible accessories for flexible station design

TECHNICAL DATA

GENERAL

Frequency Range: 3.5-4.0 MHz, 7.0-7.5 MHz, 14.0-14.5 MHz, 21.0-21.5 MHz, 28.0-30.0 MHz, WWV 15 MHz (receive only).

Mode: Selectable USB, LSB, CW or AM.

Frequency Stability: Within 100 Hz during any 30 minute period after warm-up. Not more than 100Hz with 10% line voltage variation

Calibration Accuracy: 2 KHz maximum after 100 KHz calibration.

Backlash: Not more than 50 Hz.

Antenna Impedance: 50 to 75 Ohm unbalanced nominal

Circuitry: 32 Transistors, 9 FET, 6 Integrated Circuits, 52 Diodes and 3 Tubes

Power Requirement: 100/110/117/200/220/234 V AC, 50/60 Hz, 380 Watts maximum, or 13.5V DC nominal, 6.7 A for standby, 0.7 A for

receive (Heater OFF) and 24 A for transmit.

Size: 340(W) x 153(H) x 285(D) mm.

Weight: 15 Kg.

RECEIVER

Sensitivity: 0.3 μ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz.

Selectivity: 2.4 KHz nominal bandwidth at 6 dB down, 3.8 KHz at 60 dB down on SSB, CW and AM. 600 Hz nominal bandwidth at 6 dB down, 1.2 KHz at 60 dB down with optional CW filter. 600 Hz nominal bandwidth at 6 dB down, 12 KHz at 60 dB down with optional AM filter

Harmonic & Other Spurious Response: Image Rejection better than 50 dB Internal Spurious Signal below 1 μ V equivalent to antenna input

Automatic Gain Control: AGC threshold nominal 6 μ V. Selectable AGC time constant, fast or slow. Fast attack time 3 milli-second and slow attack

time 5 milli-second. Fast release time 0.35 second and slow release time 2 seconds.

Audio Noise Level: Not less than 40 dB below 1 Watt.

Audio Output: 3 Watts to internal or external speaker at 4 Ohm impedance

Audio Distortion: Less than 10% at 3 Watts output.

TRANSMITTER

Input Power: 260 Watts PEP on SSB, 180 Watts on CW at 50% duty cycle and 80 Watts on AM. (Slightly lower on 10 meter)

Microphone: 50 K Ohm dynamic type.

Carrier Suppression: -40 dB

Sideband Suppression: -50 dB

Spurious Radiation: -40 dB

Distortion Products: -30 dB.

Frequency Response: 300 Hz to 2700 Hz ± 3 dB

Final Tube: 6JS6C x 2.

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60 Shannon St., Box Hill North, Vic., 3129.

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W.A. H.P. PRIDE, 26 Lockhart Street, Perth, 6152

Ph. 62 4379

(continued from July, 1974)

3ZY0—P S Collins, 5 Van-Wyk Court, Springvale, 5172
3ZG : R Gilard, 6 Miami Court, Bendigo, 3550

QUEENSLAND

VKA4S—K H Smith, 17 Belford Avenue, Clayfield, 4011
4NM—A B Nyhula, "Forests Lodge", Port Douglas Road, Port Douglas, 4871
4OH—D R Ham 20 Alfred St, Charleville, 4470
46J—J S Spencer, Station Burnside Road, Nambour, Postal PS 1712, Nambour, 4560

SOUTH AUSTRALIA

VK5GZ—E B Gildon, 31 Hilda Avenue, Highbury, 5089
5VU—A J Pawelczyk, F/23 Carlidge 515 MN North Road, Elizabeth, 5112
5ZLB—J B Lee, 18 Norfolk Ave., Fulham Gardens, 5234
5ZMW—B M. Wallis, Lot 9, Quintrell Road, Virginia 5120
5ZRT—R. Battilana, 7 Mitoham Avenue, Lower Mitcham 5052
6ZA—B J. Lenny, 5 Wells rescent, Valley View, 5083
5BO—A E Williams, 33 May 1800, Ottoway, 5013
5FV—V Cernacek, 21 Thompson Ave., Salisbury Downs, 5108
5ZF—M H Wood, 22 Bloomfield Cres., Elizabeth Downs, 5113
6TW—W. E. Glass Clark, 365 Shepherds Hill Road, Blackwood, 5054
6ZB—E B. Stephenson, 1 Emily Ave., Clegham, 5000
5ZOF—G C. Adams, 4 Willowie St., Eden Hills, 5050
5ZPC—P Cernacek, 21 Thompson Ave., Salisbury Downs, 5109

WESTERN AUSTRALIA

VK5XK—B. A. Wheeler, Station 1 Yalbarne St., Newman, Postal P.O. Box 146, Newman, 8733
6DR—J. G. Harman, 3 B Iverson Tce., Willetton, 6155
6NV/P—M B Bertram, Station Portlark; Postal, 26 Gloster St., Subiaco, 6008
6EM—S. E. Harrison, 18 Linton Place, Morley, 6002
6PR/T—R T. Fleher, 16 Lindsay Way, Padbury, 6025
6QR—D M. Maley, 18 Narrung Way, Nollamara, 6081
6NL—V. H. Harris "Birkhead", Lot 660 Scotsdale Rd., Denmark, 6333
6ZBC—G J. C. Coles, Station 80 Parramatta Road, Doubleview, Postal: P.O. Box 184, Doubleview 6018
6ZKO/T—P R. Casper, Lot 61, Burrinjuck Road, Gossesberry Hill, 6078

TASMANIA

NH
NORTHWEST TERRITORY
VK5AC—A J Kelso Captain Cook Hostel, Nhulunbuy Postal P.O. Box 55, Nhulunbuy, 5797
6AJ—A C. Johnson, 2922 Knowles St., Jingili, 5782
6ZRD—Dr Gordon 3312 Thornton Crescent, Casuarina 5782

CANCELLED STATIONS

AUSTRALIAN CAPITAL TERRITORY

VK1GI—1 Grant non-payment
1SR—S N Graves not required
1ZPB—S B Bell not required

NEW SOUTH WALES

VK2BE—Taree OK Youth Radio Club, no longer required
2JM—L M Wilson non-payment
2YA—L G Baker, no longer required
2XB—F R O'Hare no longer required
2ZWP—B J Foster non-payment
2AT/T—L. Almyr deceased
21U—M J McDonald non-payment
2ZGT—R C McGregor, not required

2ZY/T—H J. Smith, not required
2ZR—W. S. Baynes, non-payment
2BP—H. Pearson, non-payment
2BZF—M S. Hart, not required
2UG—R W. Eagling, not required
2BZA—W. Senler, not required
2YBE—N C. Westhead, not required
2ZCW—J. B. Webster, not required
2BVT—G Uim, non-payment
2YD—T. D. Withnall, non-payment
2ZWO—J. H. Howe, non-payment

VICTORIA

VK3DT—M. J. Ripper, transferred to New South
3XU—J. R. O'Leary, not renewed
3AZK—W. D. Harwood, now VK3SR
3AMY—M. J. Malina, not renewed
3BGO—R. N. Swift, not renewed
3YF—P. G. Miahoff, not renewed
3YFW—W. G. McDermott, transferred to Queensland
3YHU—J. J. Ross, now VK3LT
3ZHW—L. R. Stewart, now VK3ASW
3ZRO—R. W. Dutchnow, now VK3AIC
3ZQW—J. L. Grae, transferred to New South
3YGS—G. J. Clare, transferred to Queensland

QUEENSLAND

VK4AG—A. J. Greenham, not renewed
4DS—De La Salle College Radio Club, disbanded
4EJ—E. J. Chandler, deceased
4OY—J. C. A. Young, deceased
4RS—R. E. S'acey, deceased
4RT—R. C. Cost, transferred to South Australia
4YU—G. F. Dillon, transferred to Victoria
VK5OM—J. L. Watts, not renewed

WESTERN AUSTRALIA

VK6RV—R. G. B. Vaughan, left country, now in United Kingdom
6VK—T. W. Reed, not renewed
6ZAG—G. E. Walis, non-payment renewal fee

TASMANIA

NH
NH

AUGUST, 1974

NEW STATIONS

AUSTRALIAN CAPITAL TERRITORY

VK1ZB—S. H. Nielsen, 6/86 Anzac Park, Campbell, 2601

NEW SOUTH WALES

VK2DT—M. J. Ripper, 5 Cobblestone St., Mosman, 1513
2TZ—A. Roberts, 55 Windsor Rd., Kellyville, 2153
2WO—Wollongong University College Amateur Radio Club, Northfields Lane, Wollongong, 2500
2YD—T. D. Withnall, 195 Marco Ave., Panania, 2213

2AOG—J. T. Morgan, 3/83 Wentworth St., Randwick, 2231
2AOD—South Broken Hill Boys Club, Central Street, Broken Hill, 2880
2AGK—H. J. Hathrell, 5/12 Bando Rd., Cronulla, 2230
2BCU—L. N. F. Smith, 8 Dora Creek Road, Goorenong, 2265
2BDE—E. R. Cooper, c/o G. S. Bracewell, 38 Corring Road Westlimg, 2120
2BM—M. Flynn, 10 Redman Pde., Belmore 2182
2BZX—W. Lean, 3 Eighth St., Goolarook, 2384
2CAB—R. G. Wright, P.O. Box 24, Coogee, 2234
2YDD—G. J. Grant, 3 Kapala Ave., Bradbury, 2212
2YDP—A. Dalton, 66 Union St., Bexley, 2207
2ZNN/T—W. A. Watkins, 154 Moulder Street, Orange, 2800

VICTORIA

VK3CC—M. M. Cohen, 21 Bowen St., Chadstone, 3148
3JY—L. Sykes, 14 Ruskin St., Orboost, 3088
3KA—W. J. Kirkhope, 21 High Street, Lower Templestowe, 3107
3OV—P. O'Shannessy, 19 Kilpatrick Ave., Shepparton, 3630

3PC—C. R. Fine, 1 Heyington Pkwe, Toorak, 3142
3TI—R. S. Pearce 115 Penty Rd., Bundoora, 3083
3KL—J. A. Hudson 33 Burke Rd. North, East Ivanhoe, 3015
3AGA—J. T. Franklin 7 Bredford Ave., Kew, 3101
3AHS—Harbour Trust Amateur Radio Club, P. Weaver, Lot 84 Lockwood Rd., South Belgrave, 3160
3AKG—O. C. Arnold, 9 Russell St., Camberwell, 3124
3AGW—W. Babb, 78 David Ave., East Kew, 3033
3BCD—R. W. Bell, 35 Spray St., Rosebud, 3939
3BEW—J. Bayliss, 5/68 Kestrel St., Spotswood, 3015
3BHK—S. K. Bushell, 74 King Parade, Knoxfield, 3180
3YEC—P. J. McDonald, 24 Higgins Ave., Sunbury, 3429
3YEL—D. J. Stuart, 52 Burrill Rd., South Caulfield, 3162
3ZQY—H. J. De-Deugd, 422 Upper Heidelberg Road, Heidelberg, 3084
3ZVT—M. J. Atkinson, 8 Mark Court, Dandenong North, 3175

QUEENSLAND

VK4AB—S. N. Graves, 25 Churchill St., Maryborough, 4650
4AAS—E. J. Smith, 20 Tinglewood St., Kirwan, Townsville, 4814
4AE—G. K. Williamson, 210 Graham St., Cairns, 4870
4CL—L. Barrett, Flat 4/8 Ridley St., Auchterflower, 4066
4UO—E. W. B. Walton, Sunshine Motel Caravan Site Elizabeth Ave., Clontarf, 4018
4ZEG—A. E. Surge, 4 Joazeur Drive, Albany Creek, 4031
4ZJK—J. H. Bartlett, 84 Donohoe Terrace, West End, 4101
4ZYA—L. G. Baker, Station 34 Milchester Rd., Charters Towers, 4820; Postal c/o 10 8th Radio R.A.A.F. Base, Townsville, 4810
4ZZZ—W. G. McDermott, 10 Pinelands Street, Lawnton, 4801
4ZJZ—G. J. Clare, 42 Scherger St., Moorooka, 4105

SOUTH AUSTRALIA

VK5IO—R. J. W. Heister, 13 Lambert St., Ceduna, 5098
5OQ—J. Klimes, 80 Marrett Drive, Ingle Farm, 5098
5RV—R. H. Coat, 6 Waruda Ave., Seaview Downs, 5049
5RZ—D. L. Nestrom U1/28A Winchester Street, St. Peters, 5069
5ZBL—P. C. Bachel, 52 Birnie Avenue, Kensington Park, 5068
5ZSL—L. H. Smith, 66 Ways Road, Manningtonham, 5068

WESTERN AUSTRALIA

NH
TASMANIA
VK7ZY/T—H. J. L. Smith, Station 425 Invermay Road, Mowbray Heights, Postal P.O. Box 9, Mowbray Heights, 7250

NORTHERN TERRITORY

NH
COCOS ISLAND
VK9YT Wayne Warden Jr., not known "exactly" on island (Route 12, 724 Meadowbrook B, Comington, Ind. na U.S.A. 47401)

CHANGE OF ADDRESS

AUSTRALIAN CAPITAL TERRITORY

NEW SOUTH WALES

VK2KT—L. P. Gerlitz, "Ebbel" Marine Dr. Benments Head, Forster, 2426
2NL—H. J. Freeman, 318 Maroubra Rd. Maroubra, 2035
2ZK—W. G. Kuchner, Lot 3, Paterson Rd., Woodville 2321
2ADR—D. W. Reed, 100/1 Bridge St. Muswellbrook 2333



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YAESU FT101B 160/10m AC-DC transceiver. Avl EX-STOCK at \$585
— YAESU FV-101B VFO for FT101B — \$102
YAESU FT75B 80w pep transceiver — \$245
— AC power supply \$65, DC power supply \$75
TRIO TS-520 all band transceiver \$560
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6 METRES

ICOM IC-60 fm 10 watt mobile transceiver incl 2 channels \$235
ICOM IC-601 SSB transceiver incl AC pwr supply \$445

2 METRES

ICOM IC-22A fm 10w mobile transceiver incl 3 chs \$210
ICOM IC-21A fm 10w base/mobile transceiver incl 3 chs \$298
SEIWA SV-230 25w fm mobile for 2m incl 3 chs \$210
MULTI-7 10w 7m fm mobile transceiver incl 3 channels \$210
KEN KP-202 hand-held 2m fm 2 watts incl 4 chs (40/50/1/4) \$150
— Nicad chargers and nicads \$32
— stubby helical whip \$8.90
YAESU FT220 SSB/FM/CW solid state transceiver \$480

70 cm

(incl 1 channel, 435.00MHz)

SEIWA SLI-710 fm mobile transceiver, complete \$298
ICOM IC-30 10w fm mobile transceiver \$370

NOT HERE?

The gear you want may not appear on this page. VICOM can procure ANY amateur gear avl overseas (usually within 10 days) via our TELEX service. Try us!

2 METRE DIGITAL VFO

ICOM DV-21 solid state can be interfaced with other gear \$298

RECEIVERS

TRIO QR-666 all band/mode communications receiver 170 KHz to 30MHz \$275 (kit \$230)

POWER SUPPLIES

ICOM IC-3PA for ICOM mobile gear \$78
SPECIAL 12v 3 amp regulated supply from 240v \$28

VICOM 90-DAY WARRANTY ON ALL NEW PRODUCTS

RAC ANTENNA

	Model	Imp	Freq	VSWR	PRICE \$
BALUNS	BL-50A	52	1.8 - 38MHz	1.3:1	14.90
	BL-70A	75	1.8 - 38MHz	1.3:1	14.90
COAX SWITCHES (2 & 6 pos)	CS-2A	52	to 300MHz	1.3:1	21.00
	CX-6A(A)	52	to 500MHz	1.3:1	54.00
	CX-6A(B)	75	to 500 MHz	1.3:1	54.00
TRAP DIPOLES	ILI-N	52	7 to 28MHz	1.2:1	31.00
	AL48DXN	53	3.5 & 7MHz	1.2:1	31.00
	AL24DXN	52	7 & 14MHz	1.2:1	24.00
	A-4VPN	52	7MHz	1.2:1	24.00
	A-5VPN	52	3.5MHz	1.2:1	28.50
LISTENER	L1	75	3 to 30MHz	—	14.90
BALANCED FEEDER	BTF-1	800	—	—	12.00

TEST GEAR

TRIO VT108 FET VOM 8 ranges 0.5 to 1.5kv, 11 meg input, ohms 0.1 to 1000 meg, memory feature \$85
TRIO AG202A AUDIO GENERATOR covers 20Hz to 200 KHz 10v rms output, sine and sq wave, ext sync \$94
TRIO 75mm scope 20mv cm sens, dc to 1.5 MHz \$170
TRIO SG402 RF GENERATOR covers 100KHz to 30MHz \$78
D-60 FREQUENCY COUNTER including 2 metre precaler \$360

ANT. ACCESSORIES

ME-11B SWR/PWR METER 3-150MHz \$22
ME-11A UHF POWER METER \$69
AS-GM GUTTER CLAMPS 2m \$7.50
SCALAR MOBILE WHIPS
M22 2m fibreglass \$7.50 (1xw)
M60 6m fibreglass \$10.70 (1xw)
M21 2 m s.s. post \$6.90 (1xw)
COAX 58U 45c per m
RB 2metre mast amp (144-146 or 146-148) \$32

SPECIAL

VICOM 24 or 12 hr digital (electronic) clock \$39.90

FOR OUR POLICY CONDITIONS SEE PAGE 10

VICOM INTERNATIONAL PTY LIMITED (03) 82-5398

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Manager: Peter Williams

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MARCH 1975
VOL. 43, No. 3

YAESU AMATEUR EQUIPMENT



HERE'S WHERE IT IS MADE

Photo shows part of the modern Fukushima plant of Yaesu Co. in Japan. The same high quality service is followed through at the Australian Agency, BAIL ELECTRONIC SERVICES, where full facilities exist to give you the Warranty, Service and spare parts availability that is your entitlement when you purchase new high quality equipment.

Here at B.E.S. we pre-sales check all sets to help ensure that you will have trouble free operation with your purchase. And, in the event that a problem does develop, then you can be assured that your purchase gives you an equity in our service facilities and spare parts.

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THE AUSTRALIAN YAESU AGENT:—

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THE W.A. BULLETIN

WEST AUSTRALIAN SUPPLEMENT TO
"AMATEUR RADIO" MARCH 1975.

Patron	Bgdr. G.P. Hunt	C.B.E.	VK6QJ	
President	A. Austin		VK6MA	681808
Secretary	N. Penfold		VK6NE	463232
Treasurer	C. Waterman		VK6NK	684717
Asst. Treasurer	P. Dew		VK6EU	684902
Broadcast Officer	A. Austin		VK6MA	681808
Equipment Officer	G. Ogg		VK6KY	494433
Minute Secretary	R. Greenaway		VK6DA	242909
Membership Secretary	B. Pemberton		VK6VW	871269
W.I.C.E.N. Co-ordinator	P. Beacher		VK6DD	763346
Bulletin Co-editors	L. Ball		VK6AN	281100Ext240
	R. Greenaway		VK6DA	242909

All material for inclusion in the "Bulletin" to reach the editors by phone or to :-22 Salisbury St., Leederville, before the 10th. of each month.

CORRESPONDENCE.

All correspondence should be addressed to :-
Hon. Secretary, W.I.A. (W.A. Division).
P.O. Box N1002,
G.P.O. PERTH, 6001.

DIVISIONAL NEWS BROADCAST.

Sundays, 0930 W.A.S.T. VK6WI

80 metres SSB (Approx 3600 KHz)
40 metres SSB (Approx 7080 KHz)
20 metres SSB (Approx 14100 KHz)
6 metres FM (52.656 MHz)
2 metres FM (Channel 1)

GENERAL MEETINGS.

Held on the THIRD TUESDAY of each month at
7.45 p.m. at Science House, 10 Hooper St. West Perth.

COUNCIL MEETINGS.

Held on the LAST FRIDAY of each month at
7.30 p.m. at the above address - - observers welcome.

SLOW MORSE TRANSMISSIONS.

Practice sessions are held Monday to Friday
inclusive, on 3550 KHz \pm QRM at 8.30 p.m. W.A.S.T.

SUBSCRIPTIONS are OVERDUE - have you paid yours ?

W.I.A. Darwin Appeal

all donations to the Divisional Treasurer.

INTRUDERS. Make it a habit to log and report at least one Intruder every time you go on the air - please !

This concerns all SWL's.

An attempt is being made to have a column of this Bulletin set aside for all SWL's and this can only be achieved by you chaps getting behind the 8 Ball and contributing items of interest, comments and questions

It is felt that you have much to contribute and every effort will be made to encourage you to participate.

Do you know of any SWL who is not a member of the W.I.A.?? If so, let us know and we will endeavour to encourage him (or her) to join. Remember they will be joining the ranks of some of the finest chaps anyone could wish to meet. They are always ready to offer advice and assistance where ever possible. You can show your appreciation by making this column a worthwhile section of the Bulletin. Further details can be obtained by writing to the Editor clearly marking your envelope "SWL CORNER" and any contribution by way of notes, items of interest and etc. can be forwarded in the same manner. So come on chaps - lets have it.

A "pen name" may be used but all correspondence must have name and address attached.

A few weeks ago I was visiting the shack of a SWL and was most concerned to see a small child of about 3 years of age climbing under the work bench where a fully exposed Power Supply was switched on. This could have ended in tragedy. PLEASE use extreme caution with your equipment. It is a simple matter to install safety shields etc. and to put that gear back in its nice safe cabinet after you have been working on it.

Do you know of any "pirates" operating????? Remember those clots are only making things bad for us all. They have a total disregard for rules of any sort. REPORT THEM IMMEDIATELY

Wednesday 15-1-75 on 2 metres.

Who was the operator transmitting with his car radio blaring out background music. Could he be committing a breach of Regulations?

The thanks of all SWL's go to the Operators responsible for putting over the News Broadcasts on Sunday mornings. Many of us cannot phone in or be on the "call back" but we assure you that the service is greatly appreciated by us all.

I would like to hear from all SWL'S giving me your name, address, age, equipment and any particular interests. This would be of great help and may enable us to be of assistance to some other service or part of the W.I.A.

73.

SCHOOL RADIO CLUB NOTES

HAMILTON SENIOR HIGH SCHOOL RADIO CLUB

Hamilton Sr. High School have acquired an FM 60 2 metre Base Station and are keen to become active as VK6HH. Unfortunately the transceiver has to be put on to 2 metres and the club leaders VK6HH and VK6KS cannot obtain the information. Would any Amateur who is willing and has any details of this unit or know how please contact VK6NI - CJHR or 992536. The help would be gratefully recieved.

The group is also keen to obtain a 2 metre mobile transceiver at a

reasonable cost. If you have equipment for sale which does not need modification or repairs would you please contact VK6NH

BUNBURY CATHEDRAL GRAMMAR SCHOOL

The above mentioned school opened in January 1974 and immediately offered Radio 1 Option to First and Second Year students.

The following year, Radio 1 and Radio 2 were offered and about 30 boys and 4 girls took the course. Most were successful and many received certificates at the various levels after passing the Y R S exams.

This year 15 students have studied Radio 2. Seven have gained Intermediate Certificates

Keith, VK6IT the Club Organizer, has written a Radio 3 Course which prepares students for the A.O.C.P. examinations.

Three students sat for the A.O.C.P. in August. Two passed Regs and got Theory marks in the 50's. Both are keen and will be sitting again in February. We wish them luck.

A disappointing feature of the clubs activities has been the lack of skeds on VHF - only three Perth stations were contacted on 6 metres in three years although we were getting through 5 - 6 and 5 - 8 on 52.586.

Now that the school is eligible for a full callsign (VK6AG ??) and HF equipment we hope to be more successful.

If any operators (retired) can come up on 80 Metres on Mondays 4 - 5 pm or any lunchtime 1.00 - 1.25 pm we would be only too pleased to "sked" as the lads are very keen.

73 Keith VK6PT

WITCHAMORE SCHOOL RADIO CLUB

The P.M.S. Radio Club was a little late starting off during 1974 due to the lack of an Operator. We believe that some of the lads put some pressure on Len VK6W who came to their assistance and in September VK6PS was back on the air. Quite a deal of experimenting with antennas was done by the members as suitable areas are a bit of a problem. Finally came up with an Inverted V for 80 and 20 metres in time for J.O.T.A. and from reports these must have worked quite well.

Details for 1975 are at yet unavailable but do believe some of the lads will now call their stations at the Albany Hamfest.

If you didn't have any success with the last couple of "puzzles"

THIS ONE

From the QSL Manager's Report :-

'There has been a small increase in turnover with a greater proportion destined for Japan and U.S.A. This has led to a better economic handling until October last when the rise in postage was over 60%. Approval was thus requested for a rise in sticker prices to 80 cents per 100 and dated from the December General Meeting.

A close measurement of postage costs compared with cards despatched since October has been kept and in packs of 100 gm and over there is some slight gain to offset a number of obscure addressees. The position will be reviewed each quarter of this year and any abnormal situation will be advised.

The assets of the Bureau are \$79.13 to commence the new year which is considered quite adequate.'

THE WIRELESS INSTITUTE OF AUSTRALIA

W.A. DIVISION

QSL BUREAU AS AT 31ST DECEMBER, 1974.

RECEIPTS

1. to 1.74	Sale of Stickers	\$106.00
31.12.74		\$106.00
		=====

PAYMENTS

1. to 1.74	Purchase of Stamps	84.42
	Bck R315 Rental	21.00
31.12.74	Receipt Book	00.58
		\$106.00
		=====

TRADING ACCOUNT

1. 1.74	Stock of Stickers	\$65.92	31.12.74	Sale of Stickers	\$106.00
	Stock of Stamps	\$33.03		Stock of Stickers	\$ 53.08
	Purchase of Stamps	\$84.42		Stamps on hand	\$ 26.05
	Trading Profit	\$ 1.76			
		\$185.13			\$185.13
		=====			=====

ASSETS

1. 1.75	Stock on hand	
	Postage Stamps	\$ 26.05
	Stickers at cost	\$ 53.08
		\$ 79.13
		=====

VK6RU

J.E.RUMBLE QSL Manager.

Answer to last months Brain Teaser

3	8	7	2	0	-	1
5	-	3	2	-	4	4
5	-	9	-	3	5	2
-	1	6	1	0	-	-
7	2	-	1	9	1	3
0	-	-	-	7	9	2
2	7	-	1	6	-	5

A BEAM FOR TWO METRES.

Contributed by Will VK6UU.

This six element wood boom Yagi is the best performer on 2 metres I have come across. Several have been built, including 2 stacked 6 by 6.

The single 6 element has a gain of 10 db with a 3 db beam angle of about ± 30 degrees.

Elements are cut from $1/8$ in. brass rod, and the boom from a suitable length of $3/4$ in. wood.

Construction : Drill holes of such a size that the elements require tapping into position - this should hold them in place.

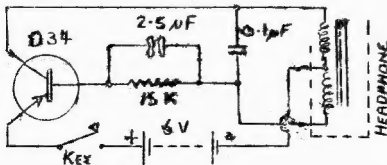
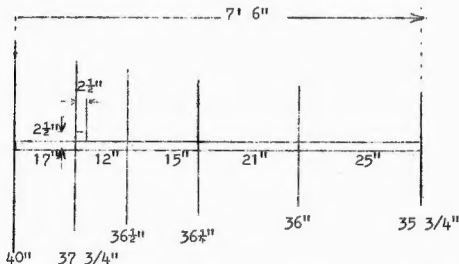
Gamma rod is mounted in the same manner and in the same plane as the elements. The Gamma capacitor is a 30 pf beehive type.

Method of water proofing - this is up to you.

When attaching coax braid to centre of driven element, divide braid into two parts and attach one half onto one side of driven element and the other onto the other side. This is necessary because the wooden boom makes attachment to the exact centre rather difficult. If you want to be sure that the elements wont fall out, a drop of solder on either side of the wood boom will do the trick.

Gamma dimensions are for 50 ohm cable.

Frequency 145.5 to 147.5. MHz.



CODE
PRACTICE
OSCILLATOR

Knock the Zed Off
your callsign-huh ?

Below are some of the highlights from the report from the Scout Association of Australia 17th Jamboree -on-the-Air.

' About 20% more Scouts, but about 20% less Guides and the lowest number of visitors for five years took part. The weather was terrible - a very stormy week-end which threatened the portable antennae systems, but showed the value of 'proper pioneering methods'- so that probably accounted for the drop in numbers.'

'Christmas Island reported in for the first time and showed what a dream DX they had- Malaysia,UK, Finland, Malawi, Italy, Germany, Bahrain, India, Sweden, Denmark, and South Africa.'

' For the first time RTTY was used between Scout Groups in W.A. and demonstrated operating DX, but not to a Scout station.'

'From the log Sheets it seems only one station in W.A. (VK6AN) was able to contact VK1BP for the official opening. Our attempts to tape the exercise for rebroadcast at a time convenient to W.A. were unsuccessful. It is still not sure whether 1500 or 2000 hours is more convenient.'

' A copy of a report apparently printed as a press release accompanied one of the Guide returns, and it shows the true spirit of W.I.A./ J.O.T.A. co-operation:-

J.O.T.A. meant a very interesting and enjoyable Saturday afternoon for the 1st. South Perth Guides and their Leader, who were accompanied by the Division Commissioner of Lee Steere South, Mrs Gelley. There were friendly conversations with other W.A. Guide and Scout Groups and with the 1st. Silkstone Scout Group of Ipswich, Queensland. The callsign was VK6LG and the operator frequently gave his identification by saying ' 6LG - Six Lovely Girls' much to the blushes and amusement of the Guides who , appropriately, numbered six. Between calls, the operator, Mr. L.G. Wilson, told of his contacts and experiences over many years of ham operating from the time he was introduced to radio in the 1920's. He played a tape recording, which included traditional Japanese music, sent by a fellow "ham", a Japanese doctor.

After having stayed far longer than intended, thanks were extended to our host, who seemed reluctant to say goodbye, and homeward bound the girls all agreed that it had been a satisfying afternoon in more ways than one- the pleasure gained from contact with other groups, and being in the company of a fine old gentleman who apparently really enjoyed himself in his first participation in J.O.T.A. with Guides.'

Once again many thanks to all those who made the weekend activity possible - Amateurs and their wives, National Organisation, Branch Staff, Liaison personnel, Leaders, Scouts and Guides.

Report from:- Peter Hughes VK6HU

Branch Commissioner for J.O.T.A.

* * * * *

This is a magic space

to make it grow B I G G E R and B I G G E R before your eyes

DONT CONTRIBUTE ANYTHING TOWARDS THE BULLETIN.

From an SWL friend of mine, Bill Marchant, en route from Melbourne to Broome, comes this first hand account of how business as usual (almost) is the order of the day in Darwin in the aftermath of cyclone Tracey. I don't think Bill or the boys in Darwin will mind me putting this to print.

Dear Ross,

I'm still "on the road" but I have made my stop-over in Darwin a lengthy one by giving a hand on some of the repair work, mainly re-roofing.

Last night I had the privilege of attending the 100th meeting of the Darwin Amateur Radio Club. This was held in the ground floor flat of Henry VK8HA, the secretary, and since the flat was a ground floor one it was in reasonable condition, the noise of a portable generator outside being the only indication that something strange was afoot. However, if you looked out the window at the wreckage of the Club H.Q. you'd realise these were extraordinary times.

The minutes of the 99th general meeting were read out:

"Meeting held at residence of VK8HA on 6.1.75

Meeting opened at 1930 hours.

Present: VK8HA, hon. sec.

Due mainly to the aftermath of Cyclone Tracey devastation, no other members available for the meeting.

(Signed) VK8HA Hon. Sec."

Needless to say these minutes were passed and seconded amid great laughter, and general business consisted of finding out the condition of beacons, towers and masts etc. This didn't take long, as they were all wrecked. Most personal equipment was intact - but water damaged and members agreed their big loss was that of technical notes and publications. Just when the Club becomes operative again is very doubtful since some members are either transferred or leaving Darwin, and those remaining have a prime concern of getting homes rebuilt so that wives and children can return. And if you see the colossal damage it is hard to imagine when that will be. By the way, some of those present were Doug VK8KK, Barry 8ZCF, Henry 8HA, Trevor 8ZEW, Dave 8ZRB, Colin 8CM, and in the visitors book I noticed the signature of Basil 6NA.

There were quite a number of QSL cards received which unfortunately cannot be acknowledged. One I notice was from R.A. Gray VK6RQ.

P.S. Rainstorm sent a few things afloat in my room, including this letter but apart from another envelope, I don't have to re-write.

I wonder if we could do a practical service for this club by collecting spare copies of "A.R.", QST, etc and ARRL Handbooks or other technical publications to help re-establish this club?

Just a brief reminder to anyone willing to do a little bit more work as a member of council - bung in a nomination form - that's the first step, then just sit back and wait for the election - if there is one!

WANTED URGENTLY

PROGRAM ORGANISER

URGENTLY WANTED

Must be willing to spend hours on the phone twisting arms by remote control. Must be flexible - able to change lectures instantly.

H A M A D S

- FOR SALE ; Mosley Tri-Band Beam
Please contact VK6WC Phone: 571550
- FOR SALE : Pye Ranger VHF Hi Band AM 12V Transceivers
Ideal for modification and satellite work \$20.00
- Pye hybrid Low Band AM \$ offer
- Weston Low Band AM \$25.00
- Pye 50W Hi Band AM Base \$40.00
- Communications Receiver Lafayette HA-600
12V and 240VAC Solid State \$135.00
- Numerous Hi Band Pye Overland 10W
50' Crank Up Tower with new guys Offer
Quantity of Aluminium Tubing
- Stack Sell Out
VK6NW Dave Bridge 574060 (B667487)
264 High Road, Riverton 6155
- FOR SALE: KP202 (Chan B, 1, 4) plus 10 NICADS
plus Charger \$140.00
- VK6EU QTHR Phone: 684092
- WANTED : Rotator Ham II, CD44 or similar.
VK6HK QTHR Phone: 462864
- FOR SALE : Globe D S B 100 Transmitter - ex VK6EJ
DSBSC 80 mx - 10 mx with H/D Transformer and wire
ready to go on air. \$50.00 o.n.o.
Contact VK6OW for demo

REPEATER GROUP NOTES

The new Solid State Repeater, which the group has decided to build, is already functional and may be in use when you read these notes.

The Repeater Fund is running short and there are a lot of users of the Repeater who have not, as yet, helped financially.

PLEASE - THE REPEATER NEEDS YOUR FINANCIAL ASSISTANCE.

Cheques etc. are payable to:

J.C. Farnell
C/- P.O. Box 87
SCARBOROUGH

W.A. 6019

EARBASHERS please note - Lecturers are required for our general meetings. Please feel free to choose your own topic!
HURRY - before someone beats you to this wonderful opportunity.